

Next Week: Datapro Software Survey

COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

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CW Photos by J. Bartimo

Wearing double-breasted hair, one member of the Anchor Pad International sales team had attendees at last week's Information Management Exposition and Conference in New York going ape.

Coverage of Info '82 begins on Page 10

Attendance at Info '82, which reached 29,600 by the third day of the four-day conference, set a record for the opening day.



User of HP 3000 Series 33 Files \$5 Million Suit Against Vendor

By Bill Laberis

CW Staff

BOSTON — A manufacturer of marine products has filed a seven-figure damage suit claiming that Hewlett-Packard Co.'s local sales force employed fraud and deceit when it sold the user a small business system that was inadequate to perform as specified.

Harry Miller Co. of Boston is seeking more than \$5 million in U.S. District Court here. Most of this is in the form of punitive and compensatory damages suffered when an HP 3000 Series 33, purchased in 1980, allegedly failed to work as represent-

ed, causing the company to lose track of its order and inventory functions.

Because of the pending litigation, HP has declined comment on the suit. However, an HP spokesman did say the Series 33 was designed specifically to handle a range of small business needs, including order entry and inventory status checking.

Introduced in 1978, the Series 33 is no longer manufactured, having been replaced by other models in the 3000 series, the spokesman said. HP now refurbishes old Series 33s and sells them as used machines.

To his knowledge, no other

suits focusing on the Series 33 have been filed, the spokesman added.

According to the suit, Miller began experiencing serious problems in system degradation immediately after the first applications were test-run in 1980. The alleged deception and fraud, Miller claimed, actually began two years before that, when the company first sought a replacement for its IBM System/3, which it had outgrown.

Miller claimed that its hardware consultant, Stanley Shein, was doing some comparison shopping, looking at

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Honeywell Unveils DPS 88 To Battle in IBM 3083 Arena

By Tom Henkel

CW Staff

WALTHAM, Mass. — Honeywell, Inc. last week announced a new top-of-the-line processor, the DPS 88, which was designed to compete with IBM's 3083 Models J and K processors.

Available in both a uniprocessor and dual-processor configuration, the unit is said to equal roughly the performance of IBM's top mainframes and offers up to eight times the performance of the firm's former top-seeded processor, the DPS 8/70.

Along with the processor, Honeywell announced a new release of its Gcos 8 operating system and a variety of software migration aids (stories on Page 8).

The single-processor DPS 88/81 — which is reportedly three to four times faster than a single-processor DPS 8/70 — can support from 16M to 64M bytes of main memory and up to 40 physical and 126 logical I/O channels. The processor is equipped with an I/O transfer unit (IOX) that reportedly has a transfer rate of 48M byte/sec.

The system is equipped with a free-standing mass storage subsystem that includes a Mass Storage Process-

or (MSP) and up to 32 disk units. Available in either single- or dual-channel versions, the DPS 88 can have a maximum storage capacity of 1 trillion bytes, Honeywell claimed. Each MSP can accommodate up to 15 fixed-disk mass storage units, 16 removable media storage units or a combination of eight fixed and 16 removable-media storage units. Each formatted disk drive can accommodate up to 1.1G

bytes of data, Honeywell said.

For tape storage, the DPS 88 uses up to eight stand-alone Magnetic Tape Processors, each of which can control up to 16 tape drives in either 7- or 9-track formats with recording densities ranging from 556 to 6,260 bit/in.

The DPS 88 is fully compatible with Honeywell's Distributed Systems Architecture (DSA). This means that

(Continued on Page 8)

Univac Adds Model 8, Caps System 80 Line

BLUE BELL, Pa. — Sperry Univac last week unveiled a new high-end addition to its System 80 line of mid-range processors. Called the System 80 Model 8, the processor is said to feature three times the internal performance of the System 80 Model 6 — the firm's previous top-of-the-line System 80 — and up to 8M bytes of main memory.

The Model 8 processor has a maximum disk storage capacity of about 11G bytes, double the capacity of the Model 6. In addition, the processor can control up to 120 local workstations with a maximum of 28 communications lines.

The System 80 Model 8 is being manufactured as part of a joint agreement between Univac and Tokyo's Mitsubishi Electric Corp. Mitsubishi is supplying part of the central processor, namely the main storage unit and selector channels. About half of the new processors will be assembled in the U.S. and half will be built at an unspecified European site. None of the machines will be assembled in Japan; a spokesman could not say where the Mitsubishi-supplied components would be integrated into the system.

Like other System 80 models, the Model 8 uses Univac's OS/3 operating system and employs the same basic architecture as other System 80 processors, including multiple microprocessor

function distribution, emitter-coupled logic circuit design and a bus I/O architecture, Univac said. It can support up to nine different printer models with print speeds ranging from 180 to 2,000 line/min, Univac said.

The processor is equipped with a newly developed Inter-Computer Control Unit

(Continued on Page 6)

DOD to Test Smart Card

By Phil Hirsch

CW Washington Bureau

PETERSBURG, Va. — Beginning next January, the Department of Defense (DOD) will begin testing the "smart card" — a device the size of an ordinary identification or credit card but containing an embedded microprocessor.

The DOD's tests will be conducted at nearby Fort Lee. During the test, some 2,000 army personnel will have to use the card to gain admittance to base hospital and commissary facilities, as well as to areas requiring security clearance.

The smart card, which was developed in France, costs a good deal more than the government's standard magnetic-stripe

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COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

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But Some Analysts 'Bearish'

IBM Earnings Rise 36% in Quarter

By Paul Gillin
 CW Staff

ARMONK, N.Y. — IBM earnings jumped 36% in the third quarter on a 21% gain in revenue as the computer giant continued to recover from the earnings slump it suffered at the end of last year.

However, while the recent figures signal a bullish phase for IBM, some analysts remained skeptical, insisting that the computer giant has yet to meet the optimistic expectations of the financial community.

IBM's net earnings in the third quarter were \$944 million or \$1.58 per share, compared with \$693 million or \$1.18 per share in the third quarter of 1981. Third-quarter 1982 gross income was \$8.1 billion, compared with \$6.7 billion in 1981.

For the first nine months of 1982, earnings were up 22% on a 16% increase in revenue, a significant gain over the 15% earnings increase reported for the first half of this year.

Worldwide earnings for the first nine months were \$2.7 billion, compared with \$2.2 billion for the same period in 1981. Net earnings were \$4.56 per share, compared with \$3.80 per share last year.

IBM said that the continued strength of the dollar hurt worldwide earnings. The company estimated that had currency rates remained constant with those of 1981, earnings would have been about \$250 million greater for the first nine months.

The company also said that cancel-

lation and deferral rates have increased somewhat in the past several months, although overall orders remain strong.

Analysts' Reactions

Analysts said the stronger financial figures are a sign that the company is in the bullish phase of a product cycle, which typically advances its earnings every five or six years or whenever a new high-end product begins volume shipments. This year that product was the 3081 processor, which was announced in late 1980. As many as 600 systems are expected to go out the door in 1982, according to Jack Hart, an analyst with International Data Corp.

However, a number of analysts say that IBM must come through with an aggressive fourth-quarter earnings performance in order to meet goals set by the financial community.

"We're disappointed with this year compared with what we expected," said Harry Edelson, an analyst with

the First Boston Corp. "They're doing a heck of a lot better than they did last year but not as good as they should be doing."

Edelson said First Boston initially projected a 50% jump in IBM earnings for the quarter but later downgraded expectations to 35%. "Anything less than a 35% increase would have been poor," he said.

Hart said IBM is mounting an internal push to increase sales as a percentage of revenue. The recently created IBM Credit Corp., which buys systems from the parent company and arranges third-party leasing and financing, is a step in that direction. For 1982, IBM sales revenue is up nearly 24%, while rental revenue has increased only 5%.

Hart added that IBM's corporate reorganization announced last October is also producing its first tangible cost-saving benefits. IBM confirmed that gross profit margins and expense-to-gross-income relationships were higher in the third quarter.

Corrections

The product announcement in Micro Notes for Data Management Systems' CCDS relational data base management package for the Radio Shack TRS-80 microcomputer [CW, Oct. 4] listed the incorrect address for the company. The correct address is Suite 101C, 211 N. El Camino Real, Encinitas, Calif. 92024.

In the chart supplied by Real Decisions Corp. to accompany "RDC Report Examines DSS Capabilities" [CW, Oct. 4], the author of the Spread package was incorrectly identified as Spread Financial Analysis and Reporting System. The author of Spread is Lupfer & Long, Inc., a firm based in Hanover, N.H.

This Week

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Intel Brings Out Chips Linking Ethernet Units

By Jeffrey Beiler

CW West Coast Bureau

SANTA CLARA, Calif. — Intel Corp. has announced a pair of very large-scale integration (VLSI) chips designed to link devices together within the Xerox Corp. Ethernet baseband local-area network.

The 82586 Local-Area Network Communications Controller and the 82501 Ethernet Serial Interface provide Ethernet compatibility for the physical and data-link layers of the network. The chip set will reportedly allow users to connect "intelligent" stations to a common network medium, such as wire cables.

Although the chips were announced recently, their debut has been expected by analysts and users for quite some time.

Announced in Europe

The devices have already been announced in Europe, and "people have been planning on these chips coming out in their budgets," said Kenneth Thurber, president of the consulting firm Architecture Technology Corp. of San Jose, Calif.

The chips, designed to replace printed circuit boards, are expected by analysts to lower the cost of local-area network implementation for end users (see related story). For instance, the cost for a typical Ethernet connection is about \$2,000, according to Michael Killen, president of the consulting firm, Strategic, Inc.

However, by using the chips, the end-user cost reportedly will drop by more than 50%. The Ethernet local-

area network architecture uses carrier sense multiple access with collision detect (CSMA/CD) to send data packets at high data rates among stations connected to the coaxial network medium. The 82586 controller's parameters are programmable so that it can be used in other local-area networks using CSMA/CD, a spokesman said.

Local-area network controllers were designed to work in conjunction with the CPU, keeping CPU intervention to a minimum for network activities. The 82586 controller chip was designed to process outgoing and incoming packets on its own, an Intel spokesman said.

The CPU can prepare many messages for transmission in shared system memory and "tell" the controller when to start and when to stop and go on to other processing tasks, an Intel spokesman said. The controller chip collects the necessary information from shared memory, prepares the packets and controls their transmission without further CPU attention.

Line Driver & Receiver

The 82501 interface chip replaces eight to 12 components in completing the connection between the host and the network. It is a combination line-driver and receiver, according to the vendor.

Serial data for transmission is encoded and driven onto the transceiver cable interface. Data received from the transceiver is filtered and decoded before it is passed to the control-

ler, a spokesman said.

Both chips will be shipped in quantity in the second quarter of 1983 and

will be sampled in February of 1983.

Intel is located at 3065 Bowers Ave., Santa Clara, Calif. 95051.

Intel Chips Gets Mixed Reception

Intel Corp.'s announcement of microchip communications controller devices for the Ethernet local-area network was met with mixed feelings from two consultants who work closely with the technology.

The chips will have their most significant impact on the end user, who will reportedly pay less for an Ethernet connection. By using Intel's 82586 communications controller and 82501 serial interface chips, the cost of installing Ethernet is expected to drop from about \$2,000 to under \$1,000. However, many users will still resist Ethernet because of its high price tag. "The cost to connect a personal computer to a network has to come down to about \$500" before many users will implement a local-area network, said Michael Killen, president of Strategic, Inc. "I don't think it's going to have a great effect," observed Kenneth Thurber, president of the consulting firm Architecture Technology Corp. of Minneapolis. "The price of an Ethernet connection is going to be coming down, but I think the chips are only a contributing factor."

Thurber forecast that three or

four companies will eventually be building Ethernet chips, a possibility that will ultimately benefit the end user through decreased prices. "Intel is just one player in the game — they're not the only player. I think that more players will make for greater competition and lower prices. But that would happen anyway," he added.

Strategic's Killen pointed out that IBM and Texas Instruments, Inc. recently announced a joint agreement for the development of very large-scale integration chips in a token-passing architecture, which is not compatible with the Ethernet standard. "By the time Intel delivers these chips," he said, "IBM and TI will be announcing theirs and that will slow the growth of Ethernet."

"With the IBM announcement, Intel had to do something to keep the Ethernet bandwagon alive," Killen said. "If IBM had not made that announcement, vendors would have stampeded to Intel."

Many vendors have thought of carrier-sense multiple access with collision detection, he noted. But now that IBM "has blessed token passing, vendors are going to have to go back to the drawing board."

Intel Adds Network Software, Cluster Module

By Bruce Hoard

CW Staff

SANTA CLARA, Calif. — In addition to introducing Ethernet communications controller and serial inter-

face chips, Intel Corp. also took the wraps off data communications software and a cluster module that allows users to connect up to nine Ethernet workstations without using

Ethernet coaxial cable or transceivers.

The Intellink module helps to create a customer-installable, stand-alone Ethernet local-area network. The resulting cluster can, as an option, be connected to a main Ethernet cable through a single transceiver, thereby reducing costs by eliminating the transceivers and installation labor for each individual workstation, Intel claimed.

Performs Same Functions

Any Ethernet-compatible device may be connected to the Intellink module without modifications and communicate with other connected Ethernet devices.

The module performs the same functions as a standard Ethernet transceiver. It buffers receive and transmit data, detects attempts by two or more stations to gain access to the line simultaneously, signals the presence of a collision to the transmitting stations and transmits the jam signal.

For small networks, the module can be used as a stand-alone device. Up to nine stations can be connected to what appears to each of them as a zero-length Ethernet cable. Alternatively, the nine workstations can be joined to an Ethernet by an Intellink module and attached, using only one standard transceiver and eliminating the cost of cable, eight transceivers and their installation, the vendor said.

The single-unit price for the Intellink module is \$2,450.

Intel's new local-area network data communications software, INA 950-1, is said to provide complete message-delivery service on top of Ethernet between stations on local-area networks. It also provides built-in network management functions that enable support and fault isolation as systems in the field.

The network software is implemented on Intel's ISBC Ethernet Multibus controller board set. It provides Multibus-based systems with "transport" and "network management" functions, a spokesman said.

Virtual Circuit Services

INA 950-1 provides all the basic transport Class 4 "virtual circuit" services such as reliable delivery, data rate matching (flow control), process multiplexing and variable-length message support.

The network management functions it performs include supporting the collection of network usage information from the transport and data link layers.

For example, that includes the number of virtual circuits in operation or the number of packets discarded due to cyclic redundancy check errors.

The INA 950-1 software is currently available and licenses for \$25,000, which covers two copies. Intel is located at 3065 Bowers Ave., Santa Clara, Calif. 95051.

Controversial Driver Registry Bill Gets Thumbs Up From Congress

WASHINGTON, D.C. — In a last-minute action before it adjourned, the 97th Congress cleared a controversial measure to upgrade the National Driver Register, a federally administered telecommunications system aimed at keeping suspended drivers from obtaining licenses in other jurisdictions.

The register, until recently headed for extinction because the Reagan administration felt privacy concerns and cost-effectiveness considerations would guarantee its failure on a national basis, was approved as part of a bill offering federal incentives to states that enact stricter drunk driving laws.

The bill provides \$9.1 million for fiscal years 1983 to 1987 for the Transportation Department to upgrade its 20-year-old register, which now relies heavily on the mails for transfer of problem-driver information between state licensing authorities.

Envisioned is an eventual nationwide on-line DP system allowing those agencies to check if license ap-

plicants have had their permits revoked in other jurisdictions.

An initial four-state pilot program will test the feasibility of the electronic system.

Pilot Test

Register supporters hope a successful pilot test will persuade states to amend privacy laws barring their participation and to appropriate the funds necessary to join the system.

An administration spokesman said recently that its opposition to the register upgrade was overcome by heavy lobbying from citizens organizations fighting for stiffer penalties for drunk driving violations [CW, July 5].

Despite a Transportation Department study acknowledging the privacy and federal and state jurisdictional problems with the system and despite what appeared to be an almost complete lack of congressional scrutiny, the measure was overwhelmingly approved by legislators responding to the emotional drunk driving issue.

Survey of DP Managers

History Bodes Well for Allied/Bendix Merger

By Jim Bartimo
CW Staff

If the Allied Corp./Bendix Corp. merger is executed as smoothly as three of the biggest mergers of the last two years, the companies' DP departments have little to worry about.

That was the word recently during interviews with DP executives involved in the earlier mergers.

The Bendix director of DP can look to another Allied acquisition, Bunker Ramo Corp., for a point of reference on how his department could be affected by the pending Allied takeover. "From my standpoint, it has had nothing but positive effects," said Joseph Larizza, director of information services and systems at Bunker Ramo in Trumbull, Conn.

"Allied Corp. has a staff of consultants and we can call on them for any kind of help," Larizza said. "Decisions for hardware and software acquisitions go through division and Allied. It's pretty much give and take. There's a lot of interaction and open communication," Larizza continued.

Du Pont-Conoco

At Conoco, Inc., "There's been no attempt to establish superiority or change reporting lines," said one DP executive who was involved in last year's Du Pont-Conoco merger. High-level decisions are made by Du Pont, but everyday operational decisions at Conoco have not been affected, he said.

At Kennecott Minerals Corp. of Salt

Lake City, Utah, which was taken over by Standard Oil Co. of Ohio, the DP department maintains "100% of the autonomy that we had," according to George Obergfell, manager of systems and telecommunications. "It's been a year since the merger, and we still have a peer relationship with Standard Oil's DP department. We both report separately," Obergfell said.

Just as organizational issues were not a problem for these companies, neither was equipment compatibility. "Both of us are large companies and are into IBM equipment. We use IBM, [Control Data Corp.'s] Cyber and Digital Equipment Corp. and so

do they," the Conoco executive said. "The techniques and disciplines of computing are similar. Even if your gear is dissimilar, it wouldn't have been a problem."

Bunker Ramo

At Bunker Ramo, the problem of equipment compatibility was also minimal. "With today's technology and mainframes, almost everybody is compatible," Larizza said. "We all use [IBM's] Synchronous Data Link Control, Binary Synchronous Communications or Systems Network Architecture."

While the DP departments seem to be immune from a consolidation, one

Conoco executive hinted that it may just be a matter of time. "If you were a company with two [IBM] 4341 departments, you'd combine them," he said. But for now, "there will be marginal consolidation."

Kennecott was said to have benefited from the merger, beefing up its telecommunications capability through its association with Standard Oil's Telecomm Networks Division, Obergfell said.

"My advice to a company going through a merger is that the company should have enough confidence in itself to provide the benefits it has to the company it's merging with," Larizza said.

Bendix DP Exec 'Not Worried' About Merger

SOUTHFIELD, Mich. — The executive director of information systems and services for Bendix Corp. said recently that it is too early to talk about the Allied Corp./Bendix Corp. merger because it has not been approved yet. But Jean-Claude Vernieres did say that he is not worried about how it will affect his DP department.

"I'm looking at it in a positive manner because of my previous experience," Vernieres said. He was in charge of information systems for General Electric Co.'s Information Systems Division when it was sold to Honeywell, Inc. some 10 years ago.

That merger "was a real success," he said. "They took the strength of Honeywell and complemented the weaknesses of GE."

As an example, Vernieres pointed to the GE 600 mainframe which, through Honeywell's marketing techniques, became a success as the Honeywell 6000, even though it was essentially the same machine.

"There are a few things that go wrong," he said. "Some people are hurt. Some go down and some go up in the company."

"I'm welcoming the merger because I've been in this position before," he said.



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House to Act on Bill Embodying ID System

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. — Immigration reform legislation, with a controversial provision for a secure employee identification system, is headed for final congressional action when members of Congress return for a short postelection session late next month.

The Immigration and Reform Act of 1982, a sweeping rewrite of the nation's immigration laws and regula-

tions, has caused considerable controversy, not the least of which has centered on a provision making employers accountable for hiring illegal aliens. In putting this enforcement responsibility on employers, the bill mandates development of a secure means of identifying those in the U.S. who are entitled to work.

The idea of creating a national ID system for employment purposes has been denounced by several members of Congress and the administration

and by civil liberties groups as smacking of Big Brother and as leading the country down the road to totalitarianism [CW, Aug. 30].

Despite their protests, the Senate version of the legislation was approved by the Senate in August and approved by the House of Representatives Judiciary Committee last month after five long days of debate. The House bill has been referred to four additional House committees for consideration of various provisions with orders they complete their deliberations by Nov. 30, the day after Congress returns for its lame duck session.

White House Approval

The White House has already announced its approval of the bill as passed by the Senate, despite what one administration spokesman called "concerns" about the ID provision. The Reagan endorsement was strongly reiterated following statements by Annelise G. Anderson, associate director of the Office of Management and Budget (OMB), that the ID system was unacceptable in a free society.

"The bill has sufficient flexibility on this question," an OMB spokesman said of the provision, adding the President would sign the bill if passed in a form comparable to the Senate version. The endorsement suggests the other provisions of the legislation are so needed that the ID proposal is one with which the administration is prepared to live. In May, the Justice Department suggest-

ed further study of the efficacy of existing forms of identification before any commitment is made to a new national worker ID system.

The bill would give the administration three years to develop "a secure system to determine employment eligibility in the U.S." The bill envisions the possible issuance of identity cards perhaps combined with a phone-in verification procedure. Also, language was included to ensure the verification data is not used for other purposes so that it does not impinge on personal privacy.

Recognizing the sensitive nature of the provision, the House also included the statement that the provision shall not "be construed to authorize, directly or indirectly, the issuance or use of national identification cards." That disclaimer, however, has not mollified critics of the ID proposal, who argue the employment identifiers will become a de facto national identification system and will probably be used for other purposes at some future date, much as the originally single-use Social Security numbers have become common means of identification.

Two Democrats on the House Judiciary Committee, Don Edwards (Calif.) and John Conyers (Mich.), for example, said in dissenting views on the legislation that "the protections provided for in the bill are not strong enough to protect against expansion of this system from the worker identification to a much more encompassing identification system."

Univac Tops Off System 80

(Continued from Page 1)

that employs fiber-optic-cable technology. Described as less expensive than a standard communications line, the device allows up to two System 80 Model 8 processors and one System 90 processor to be connected to each other at distances up to 3,300 feet. Also, the device allows System 80 processors to be linked with the firm's System 90 line of processors.

A variety of compatibility features for Univac's 90/25, 90/30 and 90/40 processors have been included in the design of the Model 8. Basically, the features allow most programs run-

ning on the older System 90 processors to be run on the Model 8.

Although the Model 8 processor does not directly replace the System 90 line of processors, it does offer roughly three times the performance of the 90/30 processor for about a third of the cost, according to Univac. The Model 8 can use most peripherals currently designed for use with System 90 series processors. Also, Series 90 systems can be used with the Model 8 in dual processor configurations via the Inter-Computer Control unit, Univac said.

A basic Model 8 processor costs \$204,056 and includes a processor, console, 1M byte of main memory, a 491M-byte disk drive, diskette drive, 180 line/min printer, systems software and the RPG-II and Univac's Escort programming languages. The system can be leased for \$5,804 on a five-year agreement through P.O. Box 500, Blue Bell, Pa. 19424.

DOD to Test Smart Cards at Army Base

(Continued from Page 1)

ID cards now in general use, but reportedly provides much greater security and offers a number of other benefits.

For example, the manufacturer, Philips Data Systems, Inc., says the smart card automatically self-destructs if a user inputs a personal ID code three times in a row which doesn't match the internally stored code. Security is important to DOD, since misuse of its present ID cards costs the taxpayers an estimated \$60 million to \$100 million a year.

In addition to destroying itself automatically, the smart card can accumulate information within its 16K-bit internal memory on more than 100 transactions. The terminal used with the smart card also has an internal memory and at the end of the day can transmit accumulated transactions to a remote computer via a dial-up telephone circuit. In the Fort Lee test, this capability will be used to update the medical record of each individual who comes to the base hospital for treatment.

If smart cards are produced in volume, their present cost — reportedly \$20 apiece vs. \$3 to \$5 for a magnetic-stripe card — would drop significantly. According to consultant Lawrence Kilty, who is helping DOD design and implement the forthcoming trial, if the smart card becomes the Pentagon's official personal identification medium, it would mean an initial production run of

five to seven million cards, and replacement orders of five million more cards per year.

Along with the smart card, DOD is evaluating a conventional magnetic stripe card and another identification system, developed in West Germany, which utilizes infrared analysis of fingerprints. The test is scheduled to run six months, and consultant Kilty believes the Pentagon will adopt one of the systems "before the end of next year."

All the new ID cards will look alike. Each one will have a picture of the holder in the upper right hand corner and will contain a special identity number. This number, along with a host of other codes representing the owner's name, rank, branch of service, blood type, sex, height, privileges and medical eligibility, among other information, will be embossed on the surface of the card and stored within the microprocessor chip's memory.

Not Only Smart Card Test in U.S.

The U.S. Department of Defense (DOD) experiments with the embedded-chip smart card might someday evolve into being the first widespread use of the unique device in the U.S. However, the DOD is not the only one investigating the card's possibilities.

The U.S. Department of Agriculture is also investigating using smart cards, but in this case to replace federally funded food stamps [CW, March 29]. Sources at the department expressed the hope that use of the cards would cut down on the amount of fraud associated with the food stamp program.

However, tests with the card will probably not begin until early next year because of budgetary restraints.

The First Bank System, Inc. of Minneapolis/St. Paul earlier this year began the first U.S. trial of the smart cards. Basically, the cards enable trial participants to transfer bank funds and pay for purchases remotely. The test is being undertaken as part of a videotex project taking place at the same time in North Dakota.

Citibank, Bank of America and Chase Manhattan Bank, as well as civilian federal agencies, are also reportedly studying possible applications of the smart card.

Meanwhile, in France, where the smart card was born, another videotex/smart card trial is underway. However, the French project involves no less than five different locations and more than 100,000 users.

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Says He Violated Nondisclosure Violation Anacomp Files Suit Against Former Employee

By Bill Laberis
CW Staff

FORT PIERCE, Fla. — In an apparent effort to show there are teeth in the bite of its employee nondisclosure agreements, a \$100-million-a-year software house is trying to stop a former employee from working for one of its former clients.

Anacomp, Inc. charged that Terrell Redden violated a nondisclosure agreement last February when he left Anacomp to work for the St. Lucy County DP department here. The county hired Redden as a DP manager to implement an in-house, county government DP system designed in part by Anacomp.

Anacomp, based in Indianapolis, filed suit in Indiana Superior Court to enjoin Redden from working for the county for two years, in accordance with the nondisclosure agreement Redden signed in 1978 while an Anacomp employee. An Indiana judge upheld Anacomp's claim in July.

However, Anacomp must now convince a Florida county judge to do the same because Redden never went to Indiana to answer the charges. Both Redden and St. Lucy County have vowed to fight Anacomp's action in Florida.

The First Round

Anacomp lost the first round of the Florida legal action on Sept. 30 when a judge turned away its request for a temporary injunction to block Redden from working for St. Lucy County as a DP manager.

Anacomp officials have declined to comment on the case because of the pending litigation.

According to St. Lucy County officials, Anacomp is trying to thwart the county's efforts to have itself named as a codefendant in the matter. The company has also engaged the services of a four-member legal team to represent its interests in Florida, indicating further the company feels there is more at stake than the employment of one DPer.

"The testimony to date shows they're [Anacomp] using this action as a lever to stop other employees from leaving the company," Devitt Adams, Redden's attorney, said in a telephone interview.

Adams has filed a motion to dismiss the case, claiming the nondisclosure agreement his client signed was invalid because it gave employees nothing in return for signing. Adams has further claimed that Anacomp never signed the agreement, rendering it a nonbinding document.

For his part, Redden claimed he has done nothing in implementing the in-house DP system at St. Lucy County that another DP manager couldn't have done. He admitted, however, that he probably helped bring the system up faster than anyone else would have.

That facilities management system and the hardware configuration to support it was designed to replace the DP services of Anacomp, with whom the county had contracted for several years before bringing up its own system in September.

According to Redden and Adams,

the county had paid Anacomp to custom-design the facilities management package for use exclusively in St. Lucy County. The county contracted to retain proprietary rights to this package, which initially was supported by Anacomp's hardware at the company's Fort Pierce office, the two men claimed.

Redden, who said he was part of the system design team while at Anacomp, said the county began experiencing degradation in the system. He blamed this alleged degradation on Anacomp's servicing other counties' DP requirements from its Fort Pierce office.

Citing "personal reasons," Redden

Computerworld addressed trade secrets and nondisclosure agreements in a two-part *In Depth* series entitled "Who Owns Innovation?" [CW, Sept. 20, 27].

left Anacomp last February to head St. Lucy County's DP department. He immediately began implementing the in-house version of the package designed by Anacomp, he said. County budget projections have anticipated annual savings of \$80,000 from the in-house system compared with the \$634,000 earmarked previously for Anacomp services.

Redden does not deny having signed Anacomp's nondisclosure agreement in 1978. According to that agreement, "an employee shall not use Anacomp's trade secrets... to establish a relationship with any of Anacomp's customers."

"The software was already the legal property of St. Lucy County," Redden maintained. "By working for them [the county], I am not competing with Anacomp."

Anacomp's suit, according to attorney Adams, is an attempt to stop an exodus of DP employees that has seen "10 to 12 computer professionals leave their employ in greater St. Lucy County in the last six months."

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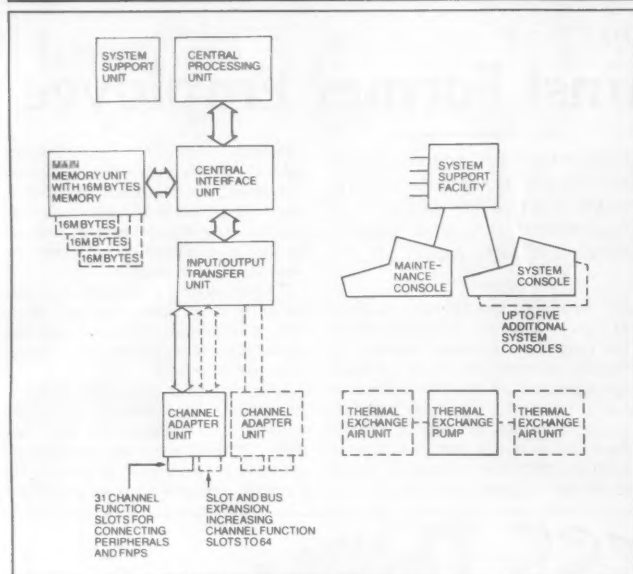
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DPS 88/81 Uniprocessor

New Release of Gcos 8 Designed to Run on DPS 88

WALTHAM, Mass. — In addition to announcing its most powerful processor to date, the DPS 88, Honeywell, Inc. unveiled a new release of its top-of-the-line Gcos 8 operating system.

While designed specifically for the DPS 88, the new release, called SR 2300, can also be used by current DPS 8 users. It will be available in the second quarter of 1983 and is a no-charge option for current users of Gcos 8, Honeywell said.

SR 2300 features additional user inquiry facilities that use a relational access manager to search Honeywell data bases.

Other new features include an Advanced System Console feature, which allows users to add up to five additional system console units with each system support facility and a stand-alone processor, which acts as a resource manager for the central

processor.

In addition, SR 2300 features a software disk cache buffer, which dynamically allocates real memory, and Data Management IV, a transaction processor that improves high-speed processing in distributed environments, according to a Honeywell spokesman.

To migrate to SR 2300, Honeywell recommends that users install the current release of Gcos 8, SR 2000. Honeywell users operating under the Gcos III operating systems must migrate to Gcos 8 to use the system, the vendor said.

Basically, conversion from Gcos III to Gcos 8 occurs in two stages: Users running Gcos III will first switch to Gcos 8 on their Level 66 or DPS 8 systems. Then, after gaining some experience with Gcos 8 in the DPS 8 environment, the users can migrate to the DPS 88.

Honeywell Announces Top-of-the-Line CPU

(Continued from Page 1)

the system can be used in distributed processing environments to communicate with Honeywell's DPS 6 small-scale processors or operate with Honeywell's Datanet 8 or Datanet 6661 front-end network processors.

The DPS 88/82 dual processor can accommodate up to 128M bytes of main memory and two IOXs, offering double the I/O transfer rate (96M byte/sec) and up to 252 logical channels. Additionally, the DPS 88/82 supports up to 16 Datanet 8 front-end network processors and up to 16 system consoles.

Users can migrate to the DPS 88/82 from the single-processor 88/81 via a field upgrade, Honeywell said.

Networking With the DPS 88

WALTHAM, Mass. — In networking applications, Honeywell, Inc.'s newly announced DPS 88 line of processors relies on two Honeywell front-end processors to provide links to a variety of public and private networks.

For systems that conform to Honeywell's Distributed Systems Architecture (DSA) Honeywell's Datanet 8 front-end processors can be used. In non-DSA environments, Datanet 6661 is required. Each front-end processor offers up to 512K bytes of memory and up to 16 front-end processors can be attached to the DPS 88

system, Honeywell said.

Networking for systems using Datanet 8 front-end processors are governed by Honeywell's Distributed Network Supervisor software. Datanet 6661 systems can either operate under the Remote Terminal Supervisor II for simple networks or under the Network Processing Supervisor for more complex networks.

In distributed processing applications, Honeywell DPS 6 processors can function as satellite processors. The DPS 6 units can also be used to connect the DPS 88 with other host processors, Honeywell said.

HP 3000 User Files Suit Against Vendor

(Continued from Page 1)

both an HP 3000 Series II Model 6 and a lower priced system from Data General Corp., when an HP sales representative told Shein of a new HP introduction, the 3000 Series 33. Shein was reportedly told the system would be cheaper and equally as versatile as the Series II Model 6.

Implementation Difficulty

According to the suit, Shein was also told that applications software developed for the Model 6 could be easily migrated to the Series 33. However, when Shein attempted to implement the first of the applications packages on the Series 33, the new system proved painfully slow for the tasks required, Miller said.

The company then hired another consultant to attempt to implement the applications packages. The consultant was recommended by HP.

This consultant, CMC Associates, Inc., was told by HP to "downplay the inherent inadequacies" of the Series 33 "in order to save the account for HP," the suit contends. Miller's attorney, Thomas Christo of Hampton, N.H., said this and several other charges were based on verbal representations made by the HP sales

staff.

After it added more disk storage capacity, Miller claimed, its system continued to be plagued by progressive failures, causing the company's gross revenues in fiscal 1982 to fall to 60% of their 1979 level.

Christo denied that the sluggish conditions prevailing throughout the economy had anything to do with Miller's business losses. Miller, he said, had fashioned something of a recession-proof business, impaired only by the company's inability to gain control over its internal finances and materials planning functions.

This, he said, was a direct result of the HP system Miller bought and is still using.

Christo said his client signed a so-called damage disclaimer as part of the contract agreement with HP. A feature of many vendor contracts, the disclaimer clears the vendor of liability from consequential damages. Some courts, however, have ruled such disclaimers invalid if fraud or misrepresentation can be shown.

Miller also charged that HP never made a computer site inspection prior to installation of the first application package. An HP spokesman said

on a 3-in.-square ceramic base. A single micropack can contain up to 70 chips and 12,000 logic gates, the

such inspections are not a standard feature of every system sold, and Christo said Miller's contract with HP did not specifically call for an on-site inspection.

'Deceptive Marketing'

Another of the charges in Miller's five-count suit claims that HP "engaged in deceptive marketing practices whereby it mislabeled its Series 33 computer as part of its 3000 line," claiming the Series 33 is based on an entirely different technology than the other systems in the line.

The HP spokesman, however, said the Series 33 was developed around the same system architecture as the others in the 3000 line to allow for easy software migration when upgrading to a different system. The system represented the first commercial application of silicon-on-sapphire (SOS) technology, he added, which enabled HP to package the system more compactly and sell it at a price lower than if SOS technology had not been used.

HP's original announcement of the Series 33 [CW, Oct. 9, 1978] billed the machine as a middle-of-the-line bridge between HP's low- and high-end small business systems.

equivalent of two conventional circuit boards, a Honeywell spokesman said. The design, in which chips are packed more closely, reportedly allows the processor to operate more efficiently.

Technically, the DPS 88 processor employs a liquid-cooled processor employing a Thermal Exchange Pump to circulate chilled water through the system. However, a Thermal Exchange Air Unit is available for sites without the appropriate plumbing for supplying chilled water. The Thermal Exchange Air Unit circulates coolant through the processor and dissipates heat into the computer room, Honeywell said.

The DPS 88 will be available for first customer shipments in the fourth quarter of 1983. A basic DPS 88/81, including CPU, central interface unit, 16M bytes of main memory, an I/O transfer unit, a channel adapter with 31 channel function slots, system support facility, system console, maintenance console and thermal exchange pump costs \$2,850,000. The unit leases for \$91,200 on a four-year agreement.

The DPS 88/82 in the same basic configuration except with two central processors, two system support units and two Thermal Exchange Pumps costs \$4,050,000 or \$141,100/mo on a four-year plan. The DPS 88 series is produced at Honeywell's Phoenix, Ariz., manufacturing facility and marketed at 200 Smith St., MS 486, Waltham, Mass. 02154.

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I WONDER HOW ACTUAL SALES FOR LAST MONTH
COMPARED TO THE FORECASTS FOR PEOPLE UNDER QUOTA
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NAME	1982 SEPTEMBER SALES	1982 SEPTEMBER ESTIMATED SALES	CHANGE	% CHANGE
SMITH	\$52,570	\$55,064	2,494	4.53
JONES	\$83,596	\$85,360	1,764	2.07
ALEXANDER	\$52,546	\$55,483	2,937	5.29
ADAMS	\$53,837	\$56,357	2,520	4.47
McNEIL	\$95,760	\$96,929	1,169	1.21
McKAY	\$36,448	\$39,694	3,246	8.18
BERGER	\$85,691	\$90,515	4,824	5.33
COLONDER	\$75,762	\$77,448	1,686	2.18

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PRINT LNAME 82-SEP-ACT-SALES 82-SEP-EST-SALES
      82-SEP-ACT-SALES - 82-SEP-EST-SALES
      (82-SEP-ACT-SALES - 82-SEP-EST-SALES) / 82-SEP-ACT-SALES
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IF REGION = 'NEW ENGLAND' AND
   82-YTD-ACT-SALES > 82-QUOTA
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and retailing—because the system incorporates a lexicon tailored to the way your company does business.

Intellect’s ability to understand English is so unique that leading software companies have arranged to integrate it into their product lines. Intellect is marketed by Cullinane Database Systems under the name “On-Line English.” Management Decision Systems offers Intellect as “ELI—English Language Interface.” Information Sciences markets Intellect as “GRS Executive.” Intellect also interfaces directly to ADABAS, IDMS and VSAM, as well as dealing with sequential files.

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Loaded Micros Highlight Info Expo/Conference

By Bruce Hoard
CW Staff

NEW YORK — Lee Data Corp. and Datapoint Corp. introduced microcomputers with various software options, including word processing, at the ninth annual International Information Management Exposition and Conference (Info '82) here last week.

Lee Data's Model 0700 Personal Workstation adds an IBM-compatible personal computing capability to the firm's existing IBM 3278 and Digital Equipment Corp. VT100 emulation offerings. The personal computing capability is being handled as an add-on unit that contains an Intel Corp. 8088 processor, 128K bytes of program memory, a single 5¼-in. floppy diskette drive, a display interface, a printer interface and four expansion slots as standard. The basic unit can be expanded to 256K bytes of on-board memory and a second floppy diskette.

The personal computing capability

is compatible with the Lee Data 80-col, All-In-One and four-color CRT monitors. The 80-col CRT monitor with the basic personal computer attachment costs \$4,749 or \$153/mo on a three-year lease.

Software supported by the workstation includes Microsoft, Inc.'s MS/DOS as the standard operating system. Digital Research, Inc.'s CP/M-86 operating system is optional. Microsoft's Basic interpreter, Basic compiler and Multiplan spreadsheet packages, as well as Micropro International Co.'s Wordstar, Spellstar and Mailmerge packages, are also available as options.

There is no charge for MS/DOS. CP/M-86 costs \$240.

The basic Model 0700 Personal Workstation costs \$2,733, with two-, three-, four- and five-year lease plans

available. The product will be available during January 1983. Lee Data is based at 10206 Crosstown Circle, Minneapolis, Minn. 55344.

The Zilog, Inc. Z80A-based Datapoint Model 1560 Small Business Computer System features a 12-in. amber screen and 64K bytes of memory, expandable to 128K bytes. It can support up to 40M bytes of disk storage, three extra terminals and a printer via RS-232C interfaces, according to Zilog.

Two Operating Systems

On the software side, the 1560 offers two operating systems, Datapoint's DOS.H Disk Operating System and a version of CP/M. If there is more than one disk system in the network, both CP/M and DOS.H can be used within the network simultaneously.

Under DOS.H, the user has access to word processing and electronic mail. The Multiplan spreadsheet package is also available.

Under CP/M, Wordstar, Spellstar and Mailmerge are available. CP/M costs \$395; Wordstar, \$495; Spellstar, \$250 and Mailmerge, \$150.

The basic Model 1561 with 1560 processor, 64K bytes of memory and the Arcnet interface board costs \$3,195, with one-, two- and three-year lease and rental options available. The Model 1566 configuration with the 1560 processor, 64K bytes of memory, a 1M-byte diskette and 10M-byte disk drive costs \$10,150.

The product is currently available. Datapoint is located at 9725 Datapoint Drive, San Antonio, Texas 78284.

Raytheon Data Systems Co. also chose Info '82 to introduce its Model RDS-200 series, said to combine word processing with personal computing, data processing and data communications.

Optional on the RDS-200 is the CP/M operating system and associated software, such as the Supercalc electronic spreadsheet package from Sorcim. Data base management and Basic language programs are also optional. CP/M costs \$500.

Three RDS-200 packages were introduced. The Model RDS-200 with word processing software and a 20 char./sec printer is \$6,495. The RDS-201E with single diskette costs \$7,995 and the dual-diskette RDS-202E costs \$9,745. Three-, four- and five-year lease plans may be arranged and all three systems all available now, according to Raytheon, based at 1415 Boston-Providence Tnpk., Norwood, Mass. 02062.

Dictaphone Corp. took the wraps off its System 6000 word processor. It features the Straight Talk natural language program as a software option. It can provide information in discrete units or as interpreted data in the form of lists, tables, hierarchies, bar graphs and scatter-plot charts, Dictaphone claimed.

The basic stand-alone System 6000 costs \$5,950 with additional word processing software and the CP/M operating system available. Dictaphone is located at 120 Old Post Road, Rye, N.Y. 10580.

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Telecommunications Technology Seen 'Way Ahead of Real World'

By Jim Bartimo
CW Staff

NEW YORK — "Technology is way ahead of the real world in telecommunications," Daniel Lavery said at the ninth annual International Information Management Exposition and Conference here last week.

Speaking on telecommunications in the office, the vice-president for product and market planning for Pactel, Inc. gave some checklists for managers who might get boxed into the wrong technology.

"I recommend that you be conservative," in what is purchased, he suggested. "Stay with unformatted messages and similar equipment for document transmission." Calling them Band-Aid solutions, Lavery recommended limited use of black box interfaces to make dissimilar communications equipment compatible.

"Offices must solve their own telecommunications problems," Lavery said. Among the questions that must be asked to solve these problems are:

- What transmission speeds are needed?
- From and to which device is transmission to take place?
- How much will the necessary equipment cost?
- How much security is needed?
- Is delivery guaranteed?

When considering the transmission of text, managers must remember

that, while message quality is easy to maintain, document quality is difficult to achieve.

Factors to be considered for effective text transmission are compatible signals, control characters, pitch, formatting, graphics and local editing functions. "An RS-232 interface does not guarantee communications and protocol transmissions," Lavery said. Calling local-area networks "part of the telecommunications puzzle," Lavery said a network should, above all, provide effective office communication. "PBX [private branch exchange] has advantages because the wires are already in," Lavery said. "You don't see many [Xerox Corp.] Ethernet installations because it's difficult to wire a large office building with coaxial cable."

When selecting a local-area network, the manager must ask how much bandwidth is needed, how many minutes per day it will be used and how much the network will cost. "You must also ask if there is an easy way," Lavery said.

One of the major problems facing office telecommunications is a lack of standards. "There is no vendor commonality and perhaps there never will be in the U.S.," Lavery said.

Despite this problem, the number of installed display devices is expected to rise from 50,000 in 1981 to 250,000 by 1985, Lavery said.

Direct, Simple Access Advised

IBM Info Center Concept 'Hodge-Podge': Exec

By Jim Bartimo
CW Staff

NEW YORK — Calling the IBM concept of an information center "a hodge-podge," Richard C. Williams said that end users need more direct, simpler access to information than what is typically offered.

Williams, a consultant with The Continental Group, Inc. of Stamford, Conn., spoke on alternatives to the IBM Information Center at the ninth annual International Information Management Exposition and Conference here last week.

The IBM approach to the information center is to set up a special organization, staffed with in-house consultants and researchers who help users learn about various computer systems, he said. As an alternative,

Williams suggested an on-line information center that is brought directly to the user via a terminal and easy-to-use programs.

"We feel the information center is a program through which you move computer power closer to the end user," Williams said. "If you erect an information center within the data processing department, how close is that to the end user?"

The problem with the IBM approach to the information center is that there are too many dissimilar systems. With a different log-on procedure for each system, a single user will probably only master one or two

of them, Williams said.

IBM is not the only one with this approach. "DBMS [data base management system] vendors are not much better," Williams stated.

"Users need direct access," Williams continued. For example, "rather than printing a phone book, put it on-line and let the executive access only that 10% of the information he needs." The procedure necessary to reach this information should be highly "user-friendly," requiring only a few keystrokes.

Williams cited a number of reasons why DP managers should closely consider some type of information

center. "One of the reasons — if you're in MIS [management information systems] — is to improve your image." Although the DP department is instrumental to running any business, it is often overlooked because it does not serve the immediate needs of the executive staff, he maintained.

Another reason to implement an information center is that most of the work has already been done. "The biggest investment that has to be made has already been made — data capture," Williams said. With company data already compiled through conventional DP, users can easily access it through relatively inexpensive terminals and networks.

Further, this type of information center will reduce paper costs and provide a new way to charge out DP services, Williams pointed out.

When installing such an information center, the DP manager should consider ease of use and installation and what types of service are offered. "Graphics are going over big with senior management," he said. "They are used to seeing charts and graphs to represent figures."

Although installing an information center is becoming easier from a technical standpoint, user resistance is still a factor. "Starting an information center is like starting over in DP, like it was in the '60s," Williams said.

CW at Info '82

Keynoter: How to Succeed in MIS

By Bob Johnson
CW New York Bureau

NEW YORK — Developing systems for senior executives is the key to a management information system (MIS) person's future, attendees were told at the Information Management Exposition and conference held here last week.

In the opening keynote address, Rod F. Dammeyer, executive vice-president for finance at Northwest Industries, Inc., said that MIS systems managers, by virtue of their technical background and expertise, can be the catalyst that brings the MIS function and senior management together and by doing so can vault themselves into positions of corporate power.

Dammeyer explained that because information networks have become the "life support" systems of today's business world, top management is required to become involved with them. He noted that these systems will need to reflect management direction and will therefore have to be integrated with the strategic plans of a business. "To accomplish this will require that top systems managers work directly with top corporate managers in the strategic planning process," he said.

Typical Procedure

The speaker described the typical strategic planning procedure, which includes the gathering of information, its analysis and finally the implementation of plans and resource allocation. He said that this complex process has become easier with the help of the computer; and because it is the groundwork for much of how a business will operate, the information system that expedites it can give a company a competitive edge.

The integration of information management with corporate management is highly important to the MIS professional, according to Dammeyer. "Senior executives will have to learn more about information management — how to use your tools — and you will have to learn more about the concerns, responsibilities and information needs of senior corporate managers."

Dammeyer advised attendees to ask themselves what kind of information is needed by senior management. "Don't think of information just in the terms by which you have defined it in your current tasks. Imagine how others must define information and how they can use it."

Another consideration for MIS professionals is that the development of information systems at the executive level rarely stems from the impetus of executives themselves, Dammeyer pointed out. In some circumstances, the chief financial officer or the vice-president for strategic planning, who may have some familiarity with MIS, may initiate a move into computing. However, since most chief executives still have a pronounced aversion to computers while needing computer systems for successful analysis, there has to be someone to "show the way."

Be the Catalyst

"You can be the catalyst who makes it happen. The systems manager knows what MIS can do. If you can understand what senior management needs done, then you may be the person in the perfect position to act as the change agent," Dammeyer stated.

The more the MIS person understands the changes information systems will have at the executive level, the more he will be better able to use them to his advantage, the speaker

said. "Many of you talk endlessly about the details of these changes — the new computer products, the accessories, the enhancements, all the latest developments in software and gadgetry. But this is not what will capture the imagination of the chief executive officer of a corporation. For the sake of your own future, think in terms of that person's vital interests and needs, rather than your own wizardry," he advised.

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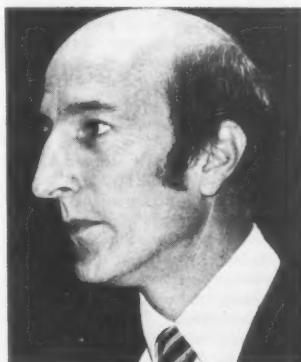
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Rod F. Dammeyer

To Understand Information Needs

CIO Should Be Near Corporate Top: Bank VP

By Bruce Hoard
CW Staff

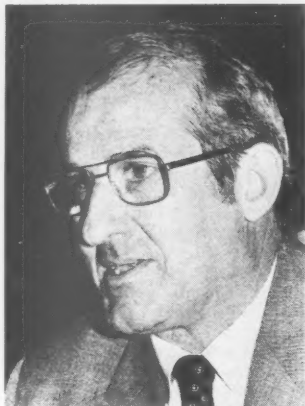
NEW YORK — The new age of information resource management needs chief information officers (CIO) who are close to top management and in control of all corporate computing, William R. Synnott said here last week.

The senior vice-president of First National Bank of Boston told attendees at the ninth annual International Information Management Exposition and Conference that the CIO should be equal to the chief financial officer.

"You cannot find out what managers' information needs are without being close to management," Synnott declared.

He said that the CIO should have the skills to handle integrated corporate and systems planning and the people involved with those processes. Referring to a recent study of the U.S.' 40 most successful companies, he said it found that 70% of the firms had business and systems plans, but only one in every five of that 70% had integrated business and systems plans.

The growing popularity of decentralized, distributed computing presents the opportunity for the CIO to gain power by presiding over a far-flung corporate computing system, Synnott noted. Offering his bank as an example, he explained how it designates DP product managers with nominal supervisory power at remote DP sites, adding that all programming is still centralized. The DP product managers remain on his pay-



William Synnott

CW Photo by J. Bertino

roll and under his control.

"That way the CIO is able to control technology throughout the organization," the senior vice-president said. The First National Bank of Boston also has a personal computer center and laboratory where interested executives can find out more about personal computers and buy them if they so desire. Volume discounts are available and the center offers training, support and a software library, he said.

With computing moving from the back office to the executive office,

good people-managing skills are required to handle the various interests of management information systems (MIS) departments and corporate management, Synnott said. There is currently a large communications gap between those two groups and it is up to the MIS leaders to bridge that gap by familiarizing themselves with the business goals of the company, he added.

The management support systems that executives require should be unstructured to accommodate the dynamic work styles of today's business environment, Synnott stated. Managers should be given prototype systems that they can use once and then discard. The prototypes must be linked to sophisticated data base systems that will allow the managers to access data quickly and easily.

"And above all, they must be user friendly," he continued. "We are not there yet."

Older systems are "user inhibiting," and current systems are "user enabling," but true user-friendly systems will employ touch or pointer technology that makes it unnecessary for managers to use keyboards, he claimed, adding, such technology is "right around the corner." Currently, most managers over 50 simply refuse to use keyboards.

"By 1990, we are going to be there with user-friendly systems and managers are going to be married to the

computer," he predicted.

Synnott explained the management support system his bank has been working on since 1976 and expressed hope that it would be complete by 1983. He referred to the initial phase as the "total customer relationship system." It was built from the bank's customer data base and featured monthly data on both domestic and international customers. It was not timely because the information was monthly and accuracy was also a problem.

Phase Two was the creation of the "lending management information system," Synnott said. That system involved putting minicomputers in user departments. The total customer relationship package was then put on the minicomputers. Users were trained to use what he called this "pseudo-data base" along with a high-level language. They also could access a host computer through the system.

But people frequently moved from one job to another where they encountered different information needs. "You could never settle down to the point where you had a system," he said.

In Phase Three, Synnott said the bank created a management support system committee with technical "coaches" for corporate planning and management information systems managers. In addition an array of technical tools were made available for the managers to use. So far, this system has been effective, he said.

CW at Info '82

Exec Sees Merging of OA, DP, Communications

By Bruce Hoard
CW Staff

NEW YORK — The boundary lines between office automation, data processing and telecommunications are becoming increasingly difficult to define, according to Gad Selig, general manager, consulting and technical services division, Contel Information Systems, Inc.

Speaking at the ninth annual International Information Management Exposition & Conference here last week, Selig lumped all three disciplines within information resource management (IRM). He defined IRM as managing current and potential computer and communications resources and supporting information creation, production and distribution in the broadest context of serving the business mission.

Referring to U.S. domestic end-user

expenditures for computer, communications and office systems services, Selig said that communications is the fastest growing area although office systems expenditures are slightly higher. According to his figures, \$42.4 billion will be spent on communications in 1982 and \$74.9 billion in 1985. On the office systems side, the comparable figures are \$46.9 billion and \$76.7 billion.

He noted that "the more advanced companies" are creating the position of chief information officer (CIO) as they realize the value of information to their businesses. One of the goals of the CIO and IRM is bringing full functionality to all end users.

Some of the pressures for a change to an IRM approach include bad economic times, the proliferation of technology and the deregulation of industries by the federal govern-



Dr. Gad J. Selig

CW Photo by J. Bertino

ment, the manager explained. IRM people must acquaint themselves with overall business issues, he said,

adding that the two processes must be "parallel." The best sponsor for the coalescence of existing technologies is the chief executive officer, "but that's not likely in many organizations," Selig said.

He laid out a corporate flowchart to show how the internal structure of a company using IRM would appear. Topping the chart was the president. Directly under the president was the CIO, and under the CIO such departments as office automation, IRM operations, administrative services, business unit/corporate staff, coordination facilities management, IRM development and planning support and people/technology programs.

If top management resists overtures to adapt to IRM, do not fight, Selig said. Instead, pick up work on a related project so that positive results from it can be presented to the recalcitrant executive at a later date.

He also warned users about problems associated with ever-growing numbers of vendors. When a company has diverse information needs, different parts of it are likely to talk with different vendors about solutions with the end result being as many opinions about the right vendors as there are user departments. In the event specialized needs cannot be met by any vendor, Selig encouraged users to "make what you can't buy" with the help of companies oriented toward custom jobs.

ADR, EDS Enter Joint Marketing Venture

NEW YORK — Applied Data Research, Inc. (ADR) and Electronic Data Systems Corp. (EDS) have entered a joint marketing venture through which 16 ADR software products will be provided through a time-sharing facility EDS recently has acquired.

The announcement was made at the ninth annual International Information Management Exposition and Conference here last week.

Eleven of the 16 ADR software products are being used in the Army's Project Viable, which is a three-year effort begun in April to provide an integrated nationwide computer network to revamp its information processing capabilities. These include its Datacom/DB family of software, The Librarian, Roscoe, Look Autoflow II, Metacolib and Cobol/DL. Added to these via the EDS time-sharing system will be

ADR's Empire, ADR/E-Mail, Datacom/DC and ADR/ETC.

EDS's Optimum Systems Division will be the operations center for the new venture. The software will be available, charged on primarily a transaction basis, according to EDS.

EDS' headquarters are at 7171 Forest Lane, Dallas, Texas 75230 and ADR's headquarters are at Route 206 & Orchard Road, CN-8, Princeton, N.J. 08540.

Software Firms Unveil Products at Conference

NEW YORK — A number of software firms used the ninth annual International Exposition and Conference here last week as an occasion for bringing out new or enhanced offerings.

MSP, Inc. introduced Sourceman, a data-dictionary-driven applications development system intended for users of IBM OS and DOS systems.

Sourceman reportedly extends control over applications development by ensuring that programs are consistent with an installation's standards and the definitions stored on the data dictionary. The OS version is available for between \$20,000 and \$30,000, depending on selectable units, and the DOS version is priced at 40% less, from 131 Hartwell Ave., Lexington, Mass. 02173.

Consumer Systems, Inc. unveiled releases of its Databasic testing tool for IBM IMS/DL/1 applications programmers and its Test/IMS product for testing IMS applications programs. Among the new features of Databasic are a module designed to reduce the CPU cycles used to move segments within the system, a checkpoint/restart capability and an enhanced parameter card generator. Databasic is available to new OS users for a permanent license fee of \$23,500. A DOS version is available for \$13,500.

Test/IMS includes full-screen support without IBM's TSO, the replacement of standard dump with minidump and the elimination of TSO for testing, the vendor said. It is priced at \$16,000 for a permanent license. Consumer Systems can be reached through P.O. Box 3637, Oak Brook, Ill. 60521.

Walker Interactive Products, Inc. announced that Forecasting, a multiple-issue pick list, ABC analysis and

CW at Info '82

cycle counting were added to its Integrated, Interactive Materials Management (II/MM) package.

Available for users of IBM OS and DOS systems, the enhanced software runs under IBM IMS and CICS environments. First customer deliveries of the enhanced II/MM offering will begin in January. It is priced between \$50,000 and \$65,000, from 100 Mission St., San Francisco, Calif. 94105.

Information Builders, Inc. announced Release 2.0 of its Focus IMS/DC interface that is said to include a Help facility, a full-screen editor under IBM's IMS/DC and user-selectable execution modes.

This option for Focus sells for \$8,500 and will be available late in the fourth quarter.

The vendor also announced the creation of a linkage between Focus and Standard & Poor's Compustat II financial data base. This interface is priced at \$5,000, from 1250 Broadway, New York, N.Y. 10001.

A link between Computer Pictures Corp.'s Trend-Spotter color graphics hardware/software system and Execucom Systems Corp.'s Interactive Financial Planning System (IFPS) software was described at the show.

Pricing for the IFPS software with the Trend-Spotter interface will be approximately \$80,000, depending on configuration. Availability is approximately 90 days. The microprocessor-based Trend-Spotter system is priced from \$40,000 to \$155,000.

Computer Pictures Corp. is located at 20 Broad St., Boston, Mass. 02109. Execucom can be contacted through P.O. Box 9758, Austin, Texas 78766.

SAS Institute, Inc. announced the availability of a free test version of its Portable SAS on Digital Equipment Corp. VAX/VMS systems during the first quarter of 1983.

This will include the vendor's SAS/Graph, SAS/Econometric & Time Series and SAS/Full Screen Product. The commercial version of SAS for the DEC systems will be released in April and will be priced at \$5,000 for the first year (for corporate users) and \$2,500 for subsequent years. The vendor can be reached through SAS Circle, Box 8000, Cary, N.C. 27511.

Five new data bases have been added to Dialog Information Services, Inc.'s Dialog on-line information retrieval service.

They include Retrospective Machine Readable Cataloging, an on-line version of the U.S. Library of

Congress catalog, which is available for \$85 per connect hour, plus 25 cents per full record typed or displayed and 35 cents per full record printed off-line.

Mathfile, which corresponds to the print publication, Mathematical Reviews, is available for \$55 per connect hour and 20 cents per full record printed off-line. Chemlaw, which contains the full text of regulations published by the U.S. Code of Federal Regulations and updates from the Federal Register, is available for \$150 per connect hour plus \$1.50 per full record printed off-line.

The Textile Technology Digest is priced at \$65 per connect hour plus 15 cents per full record printed off-line and the charges for the Services Directory to the Electronic Yellow Pages are \$60 per connect hour plus 20 cents per full record typed, displayed or printed off-line. Dialog is located at 3460 Hillview Ave., Palo Alto, Calif. 94304.

Opinion Split: Do Hard Times Affect Conference Attendance?

By Bruce Hoard
CW Staff

NEW YORK — Attendees at the very well-attended ninth annual International Information Exposition and Conference here last week divided on the question of how hard economic times affect the ability of people to attend computer conferences.

"Well, I think most companies have cut back a little bit," Ronald E. Zajac, vice-president of Windings, Inc., Goldens Bridge, N.Y., replied. "Our company sends one or two people instead of four or five," he added, noting the firm still attends its customary shows.

John Finnegan, division manager of New York Telephone Co. in Buffalo, N.Y., said, "I don't think the economy affects attendance that badly. People who want the state of the art think it's worth it. If you want to find it all in one spot at one time, this is the best choice around."

"It's kind of rough unless the company picks up the tab," Joe Grady, operations supervisor with Boces III in Patchogue, N.Y., commented. Citing the high cost of hotels and parking, he said, "We used to do a lot of traveling, but we don't have the

money in our budget anymore."

Logica, Inc. videotex consultant Brenda Lewis of New York said, "I really don't think it has an impact except with the numbers of people any one company may send. How else do you stay caught up with the state of the art?"

"I think it has an effect," according to Karen C. Christie, customer consultant with Datatel Minicomputer Co. in Alexandria, Va. She said she had just come from another conference where attendance was low. According to her, only "truly interested buyers" are coming to shows.

James H. Markwood, supervisor of planning and technical support with the Tennessee Valley Authority in Chattanooga, Tenn., said, "I think that the economy is a limiting factor. Travel budgets in my organization have been tightened." He added that his company is being more selective and going to bigger shows.

Beth A. McMahon, account executive with Music in the Air in Cincinnati, was of two minds. "I think it affects the ability to attend very much," she said. "But people are going to come anyway because this is where all the action is."

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Consistency, Usability Seen in DP Grab Bag

By Susan Blakeney
CW Staff

DALLAS — What will you find in the data processing product grab bag in the next few years? Look for greater consistency, new architectures and improvements in usability was the advice from Asa Lanum, vice-president of research and development at Pansophic Systems, Inc.

During a speech entitled "New Dimensions in Productivity" at the National Pansophic Users Learning and Sharing Exchange (Pulse) Conference held here last week, Lanum discussed several other industry trends



CW Photo by S. Blakeney
Asa Lanum

and goals worthy of note. In 1978, only 50% of all DP

shops had a data base management system, according to Lanum. But by the end of this year, that number will have jumped to around 70% and continue to grow.

Processing is moving from batch to on-line, while language usage is shifting from Cobol to assembler to PL/I. One-third of all DP operations remain batch systems in 1982, Lanum claimed, while one-third have on-line retrieval capabilities and only the last third is truly on-line.

Real-time operating environments are migrating from DOS to OS and VM operating systems, he continued. Products, meanwhile, are go-

ing to have to achieve a new level of independence from the operating environment.

Be on the lookout for multiple environments, too. "It used to be that shops had one operating environment. Now they have a primary environment and a second and third. VM, DOS, MVS, CICS — we use all of these on our IBM machines," Lanum said.

Products must attain more consistency because of these "mobile user environments that have people changing systems day to day," Lanum

suggested.

While there is currently a "real drive for simplicity" going on in DP, Lanum noted that sophisticated networking and "a significant rise in complexity" are also

happening in the very same climate. Lanum anticipates that a new IBM architecture will address this issue.

More and more emphasis will be placed on the information center concept, rather than the application center, "and I'd like to see an 'executive center' as well," Lanum related.

CW at Pulse

Giving A Hoot About O-W-L's Fate

By Susan Blakeney
CW Staff

DALLAS — The primary reason James Richards bought On-line Without Limits (O-W-L) software in 1978 was to hold down program maintenance.

During an interview at Pansophic Systems, Inc.'s Pansophic Users Learning and Sharing Exchange (Pulse) conference here last week, Richards, vice-president of First National Bank in Waco, Texas, related how he selected the on-line source program development and maintenance product.

Richards runs O-W-L on an IBM 4331 Group 2 system under DOS VSE. His data processing staff of 33 handles the information processing load for First National Bank, with assets of \$270 million, and 21 other Texas banks. O-W-L's extensive audit trails, on-line capabilities, ease of installation and cost combined to make it "a perfect fit" for First National, according to Richards.

"Bank examiners and auditors encourage good audit capabilities in the area of programming, especially if it's an on-line environment," he explained.

With the recent acquisition of National Computing Industries (NCI), Pansophic obtained the O-W-L product. Ironically, Richards also considered Pansophic's Panvalet and Librarian software before deciding eventually on then-NCI's O-W-L because he believed that O-W-L outperformed the other two packages. Richards is now very curious, however, about Pansophic's acquisition of NCI and what Pansophic's plans are for O-W-L.

Ronald Tanner, who is the assistant vice-president and senior systems programmer at First National, echoed Richards satisfaction with O-

W-L.

"We're also using O-W-L Procs very extensively instead of IBM Procs with JCL," he said.

Richards added that "We've interfaced some of our utilities into O-W-L Procs ... it's

a good performer."

In summation, Richards said O-W-L "was a good product when we bought it — it's even better now ... For these reasons we're very interested in what Pansophic will do with it."



CW Photo by S. Blakeney
James Richards

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	VT131 CRT DecScope	1,745	167	93	63
	VT132 CRT DecScope	1,995	190	106	72
	VT132AC Personal Computer Option	2,395	230	128	86
	VT145 Portable Terminal	1,595	153	85	58
	VT165 Bubble Memory Terminal	2,555	249	138	93
	VT165 CRT	1,795	173	96	65
	VT175 Portable KSR, 120 CPS	1,795	173	96	65
	VT177 Portable KSR, 120 CPS	2,195	211	117	80
	VT180 RD Printer	1,695	162	86	61
	VT180 KSR Printer	2,195	211	117	80
	ADM1A CRT Terminal	585	57	34	22
	ADM5 CRT Terminal	645	62	36	24
	ADM32 CRT Terminal	1,165	112	65	42
	CIT-101 CRT	1,525	147	82	55
	CIT-161 Color CRT	2,675	257	143	97
	CIT-427 Color Graphic CRT	3,095	297	165	112
	910 CRT Terminal	650	62	36	24
	925 CRT Terminal	850	82	46	31
	950 CRT Terminal	1,075	103	57	39
	Letter Quality, 7715 RD	2,695	259	144	98
	Letter Quality, 7725 KSR	3,195	307	171	115
	2030 KSR Printer 30 CPS	1,195	115	67	43
	2120 KSR Printer 120 CPS	2,195	211	117	80
	MX-40 F-T Printer	745	71	42	27
	MX-100 Printer	895	86	48	32
	ED400 4 Channel Stat Mix	1,525	147	82	55
	ED500 8 Channel Stat Mix	2,050	197	110	74

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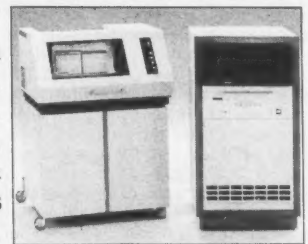
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May Drive Modem Costs Even Lower Experts Predict Modem on a Chip in Near Future

By Bruce Hoard
CW Staff

The modem on a chip will be available in the near future and will drive rapidly declining modem costs even lower, two communications industry experts said in interviews last week.

Dave Fisher, a member of Arthur D. Little, Inc.'s senior professional staff, said low-speed modems are "in a sense" available in chip form now. It is currently possible to buy all of the digital processing components of a modem in chip form, he said, adding that analog components will soon be available on a second chip.

How long before the analog technology is reduced to silicon? "I wouldn't be surprised if we were talking about a period of no more than a couple of years," Fisher said.

Increased Requirements

The more specific filtering and increased intelligence requirements of high-speed modems mean it will be longer before they are available in chip form, he noted. Within a year or two, he predicted, a basic 9,600 bit/sec modem will be available with all its computational components on one chip.

That does not mean a complete modem will be housed in a 4-sq-in. casing, because options and flexibility requirements will create "a box of reasonable size," he said, adding the modem will still be on a standard 5-

in. by 9-in. card.

However, it may not be appropriate to put the complete modem on a chip, according to Fisher. "Getting it into one package doesn't really save you a whole lot," he observed. "What's important is getting down to a small number of chips, each one which is built in a technology which is appropriate to the part of the circuitry it implements."

For example, if there is a digital part of the circuitry that does computation, it is appropriate for a chip. An analog filter is a different type of technology and best integrated as a separate piece, he said.

"When you're talking about something that costs thousands of dollars, it doesn't make a whole lot of difference whether it fits in a matchbox or a paperback novel," he declared.

Smaller modem makers may find it tougher to compete against larger companies as chip technology improves. Currently, for low-speed modems, the necessary chips are readily available from major manufacturers such as Texas Instruments, Inc. or Motorola, Inc., he said. Thus, any small manufacturer can acquire them for its modems.

However, if modems contain only three chips and are easy to build, personal computer companies such as Radio Shack may choose to implement the chips themselves rather than buy complete modems from

smaller companies, which will then suffer, Fisher claimed.

"You can't make much money when everybody in town can buy the same chips and get the same exact performance," he said.

Charles R. Robbins, director of communications programs for International Data Corp., a market research firm, said a typical 2,400 bit/sec modem costs around \$1,800 today and "clearly you're going to see a major drop in the price."

Major Cost Element

He said the enclosure has been the major cost element of modems. By reducing modems to chips, that packaging problem will be eliminated. In largely chip form, the 2,400 bit/sec modem that costs \$1,800 now will be reduced to about \$1,000.

Robbins expects to see such large modem makers as Paradyne Corp. and Racal-Milgo, Inc. working with large semiconductor manufacturers toward that goal.

The driving force behind modem-chip technology is the increasingly evident "hybrid world" of integrated communications, he said. The desire for higher volume data rates and multiple functions over shared communications lines connecting such devices as private branch exchanges with local-area networks will be at the root of chip development.

Back in the mid-'70s, modems cost approximately one dollar for each bit/sec of transmission speed, Robbins explained. However, the advent of serious market competition and more sophisticated technology undermined that scheme, Robbins said.

Stoppel Elected OCLC President

DUBLIN, Ohio — William Stoppel, director of libraries at Drake University, was recently elected 1982-1983 president of the On-Line Computer Library Center (OCLC) Users Council during its recent meeting held here Sept. 20.

Helen Spalding, head of technical services at the University of Missouri, was elected vice-president. The group's new delegates-at-large include Berna Heyman, head of bibliographic services at the College of

William and Mary; Sister Mary Dennis Lynch, director of library services at Rosemont College; and Elaine Rast, who is the head of automated records at Northern Illinois University.

Members of the OCLC Users Council are from those communications networks, systems, consortia or groups of libraries that contract directly with OCLC.

OCLC is located at 6565 Frantz Road, Dublin, Ohio 43017.

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*CINCOM SYSTEMS POWERFUL FOURTH GENERATION LANGUAGE

Energy Developers Share System First VAX-11/730 Users Register Satisfaction

By Paul Gillin
CW Staff

ARTESIA, N.M. — Ray Miller is keeping his fingers crossed. If the Digital Equipment Corp. VAX-11/730 supermini recently installed at his company here continues to perform as well as it has, Miller says he will be a very happy man.

Mar-Bob Energy, Inc. is reportedly the first commercial customer installation site in the country for the Model 730, the latest offering in DEC's 32-bit VAX-11 line. "It really has been nice so far,"

said Miller, secretary/treasurer and de facto data processing manager of Mar-Bob. "I expect to have problems with any new system, but we haven't had any in the three weeks the system has been running. We're excited about this new machine."

Mar-Bob, an oil and gas developer with about \$5 million in annual revenues, shares the packaged VAX system with neighboring energy developer Mack-Chase, Inc. The system was purchased by Mack-Chase's holding company, Comple-

tion and Production Services, Inc. of Lafayette, La., from Up-Time Systems, Inc. of Oklahoma City, an OEM for DEC systems.

The configuration consists of a 1M-byte VAX-11/730 with 128M bytes of fixed storage and 10M bytes of removable storage, seven DEC VT101 and VT102 terminals and a Decwriter character printer. The Model 730 currently supports three terminals each at Mar-Bob and Mack-Chase and a single terminal at Completion and Production Services.

Networking capability will be added in the second quarter of 1983, according to Robert Stiles, information systems manager for Completion and Production Services. However, networking software has not yet been chosen.

Software packaged by Up-Time for Mar-Bob includes word processing, general ledger, accounts payable and receivable, project control, joint interest billing, inventory, payroll and fixed assets.

Mar-Bob previously used a Burroughs Corp. B80 mini and Mack-Chase used a system based on an Ampex Corp. processor. The Ampex-based system was made by the now-defunct Epic Computer Corp. of Lafayette, La. Stiles said the growth of the two companies, about 30% over the last two years, justified an upgrade to a larger system.

The VAX was a natural purchase for Completion and Production Services, which is building an information network among its subsidiary companies, Stiles said. "We bought a VAX-11/750 about a year ago and wanted to purchase a like system to use as a small node in a larger network," Stiles said. He favors the VAX 32-bit architecture because he feels that 32-bit superminis offer greater expansion capabilities.

"Since I was on the front end of installing new processors, I wanted a new system with capabilities to expand. The 11/730 offered that."

Miller said the system installation was flawless, apart from a single failed terminal port that DEC replaced immediately.

"They said they would install the system on Monday and start training the operators on Tuesday," Miller said. "I thought, 'Sure they will.' But the system was up

and running within 1½ hours and training started on Tuesday morning. That was a nice surprise."

One notable feature of the system, Miller said, is the ease with which it can be shut down and started up. "We had a terrible storm one night which required that I shut down the system," he said. "I found that was fairly easy. The next morning, I just turned a key to bring it back up. It reboots itself."

The remote terminal support capability of the VAX enables Mar-Bob to operate in an office environment. "With the old Burroughs, we had to use a single terminal located in the air-conditioned computer room with the computer," Miller said. "Now we can use multiple terminals in an office environment without having to run back and forth to the computer room."

'Not Enough Ports'

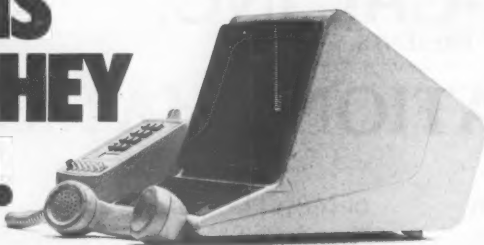
Although he is "really impressed" with the VAX, Stiles criticized the lack of terminal ports in the hardware. "I think eight ports is too few for this system," he said. "In order to add eight more ports, we have to buy a new cabinet at a cost of about \$5,500."

Several features of the Up-Time software have streamlined the process of generating accounting reports, Miller said. A general ledger standard entry function enables Miller to key in standard administrative overhead, pumper and supervisory charges for each well operated by the company.

Those charges are then automatically added to the monthly usage bills of each of the 80 customers the company serves, without the need to rekey the information.

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CMG Nominations Due

PHOENIX — The Computer Measurement Group, Inc. (CMG) is soliciting nominations for this year's A.A. Michelson Award, which will be presented in December.

The nominee is required to qualify on at least two of the criteria listed below and is expected to qualify on at least four criteria.

The criteria are as follows:

- Contribution of a new computer performance analysis or management approach.
- Contribution of a new computer performance data collection, data reduction, simulation or analysis tool.
- Contribution by innovatively proving the feasibility

and utility of a computer performance tool or approach.

- Presentation of ideas and results about computer performance through papers.
- Active aid and encouragement of others in developing techniques in computer performance measurement, analysis and management.
- Contribution to the success of computer performance professional organizations by serving as an officer or director or by serving in the conduct of a professional conference.

The organization requests that nominations be submitted in writing by Nov. 1 to P.O. Box 26063, Phoenix, Ariz. 85068.



American Express Co.'s state-of-the-art Travelers Cheque Operations Center, officially opened in Salt Lake City earlier this month, is located on 52 acres.

Doesn't Leave Home Without It

Financial Company Goes Far With Operations Center

By Shelly Heller
And Judith Axler Turner
Special to CW

SALT LAKE CITY, Utah — The travelers checks you don't leave home without have a new home of their own in a data base system that was inaugurated here earlier this month when American Express Co. officially opened its Worldwide Travelers Cheques Operations Center. According to American Express, it is the first interactive travelers checks center in the world.

While "not quite a quill-and-inkwell operation beforehand, a tremendous amount of manual labor was involved in inventorying and processing travelers checks before the new systems were developed by American Express," Robert J. Seitz Jr., a company spokesman, said. "Paperwork is expected to drop 50% and, no doubt, costs will also drop dramatically."

The new facility, which is bringing 1,200 jobs here, handles all phases of travelers check operations except investments, which are still New York-based.

It was not only designed as an aid to travelers check buyers — one out of 200 customers loses his checks — but it is also a computer-based weapon against increasing competition from nearly 30 other travelers check issuing companies in the U.S. and many more worldwide.

A total of 75 applications programmers and 25 software technicians began work 2½ years ago to design American Express Travelers Cheques' Distribution Inventory Management System (DIMS). The system is based on an existing IBM IMS data base management system.

DIMS runs on an IBM 3081, backed up by an IBM 3033. Two hundred disk drives, each capable of storing 317M

bytes of information, maintains the history of each Travelers Cheque printed.

DIMS, which was originally written as a batch system, was converted to a data base only system to decrease error possibilities.

"The volume was too much for the batch system and a simple operator error could be deadly," explained Richard C. Hicks, senior vice-president of Travelers Cheque Operations and Systems, who runs the Salt Lake City facility.

Instruction Printout

With DIMS, Travelers Cheques printing plants in England and the U.S. receive computerized instructions about quantities, denominations and serial numbers of checks to print. Every night, through a dedicated dial-up line, DIMS instructs distribution units which checks to send to each of American Express' 89,000 Travelers Cheques sales offices around the world.

The instruction printout also serves as a receipt. After it is signed by the selling office (a bank or travel agency), it is shipped back to the Salt Lake City facility by air and entered into DIMS.

"If the receipt doesn't come back in a reasonable length of time, DIMS notes that as a possible shipment of checks lost or stolen, and the bank is contacted," Hicks said.

When Travelers Cheques are sold, customers fill out a purchase application form, which is micro-encoded. A copy of the form is forwarded by courier to Salt Lake City, where the sale is entered in DIMS' data base.

Cashed travelers checks are similarly forwarded to Salt Lake City, where they are read by one of two IBM 3890 magnetic ink character recognition (MICR) reader/sorters. The information is matched with the informa-

tion in DIMS' data base.

If there is a question about a returned check, it is kicked out for confirmation. Otherwise, checks are cataloged and stored for three years.

Lost Check Operation

The other end of the process is the lost check operation. "If a customer doesn't lose his check, we have no interaction with him," Hicks said. When checks are lost, the Settlement Processing System (SPS) is activated.

SPS provides banks and other selling outlets with status reports on their accounts, sometimes by telephone. Check status information is also available to customer representatives via CRT terminals. SPS accesses the same data base as DIMS.

When an American Express customer loses his Travelers Cheques, he can call the company for a refund. If he can identify himself, the serial numbers of the checks he lost and the bank at which he bought them, a refund is authorized immediately.

If the customer has lost his identification along with his Travelers Cheques, or if he cannot provide the serial numbers, a specially trained staff member will work with him to confirm the purchase and provide the refund.

The DIMS data base is updated daily from SPS reports of lost checks to ensure that fraudulently cashed checks are caught. Merchants are not reimbursed for cashing checks on which the signatures do not match.

Travelers checks were invented by American Express in 1891 as an alternative to the letter of credit, which was limited to certain banks and bankers' hours. That year, 248 checks were sold for a total of \$10,000.

Today, sales are measured in billions of dollars annually in American and foreign currencies.



During the peak season, an IBM 3890 Micr reader/sorter is expected to batch process approximately 80,000 Travelers Cheques and 50,000 sales applications hourly.

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Managers on the Move

KELSEY W. HILL has been promoted to director of corporate telecommunications and systems support for Ryder System, Inc., the parent company of a group of service-oriented companies providing highway transportation, distribution and business services located in Miami. He will be responsible for Ryder's voice and data telecommunications systems and also for technical assistance related to systems development.

Hill joined Ryder System as a senior telecommunications consultant in August 1978. In March 1980 he was promoted to manager of consulting services, which he held until his recent promotion.

Before joining Ryder, Hill worked for Southwestern Bell Telephone

Co., AT&T Long Lines and C&P Telephone Co. and was a business analyst for Dun & Bradstreet, Inc.

He holds a BBA degree in business management from Marshall University and an MBA degree from Nova University.

...

LARRY L. BURESH has been appointed vice-president of management information systems for the Ben Franklin Division of Household Merchandising, Inc., headquartered in Des Plaines, Ill. He will be responsible for all Ben Franklin headquarters and regional data processing services and all phases of computer systems provided for franchise oper-

ations.

Previously, Buresh served as data processing systems manager for Sears, Roebuck & Co.

He received a B.S. degree from Northern Illinois University.

...

DONALD C. SENEGES JR. has been named director of quality assurance for the Management Information Systems Department of Columbia Pictures Industries, Inc., a subsidiary of the Coca-Cola Co., with headquarters in New York.

Seneges joins Columbia after serving as president of CAI, a Westport, Conn., firm that he founded in 1979 for job recruitment of DP profession-



Kelsey W. Hill

als. From 1977 to 1979, he was director of information services for Bunker Ramo, where he was responsible for all DP functions. Prior to that, Seneges was corporate manager of information systems for five years for Houdaille Industries.

He received a B.S. degree in engineering from Bucknell University and an MBA degree in marketing from the Wharton School, University of Pennsylvania.

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Horizon Meet Slated Nov. 7-9

CINCINNATI — Horizon, the Tominy, Inc. user group, will hold its annual meeting Nov. 7-9 at the Westin Hotel here.

Providing software primarily to IBM Series/1 users, Tominy produces Data Base-Plus, a distributed data base management system. This year's Horizon meeting will focus on industry directions for hardware and communications, the company said. Guest speakers include David W. Belote, IBM's manager of special marketing support for the Series/1, and Robert W. Snoffer, a telecommunications consultant and president of the Cincinnati-based Management Communications Consultants, Inc.

The three-day meeting costs \$175. For more information contact Sandy Moonert, Horizon Coordinator, 4221 Malsbary Road, Building One, Cincinnati, Ohio 45242.

Call for Papers

INTERNATIONAL INFORMATION/WORD PROCESSING ASSOCIATION'S (IWP) SYNTOPICAN XI '83, San Francisco, June 13-16.

IWP has issued a call for professional papers to be considered for presentation at Syntopican XI.

The conference program will have an emphasis on integrated information systems and papers should be of a technical or managerial nature.

Submissions are due no later than Jan. 3 and should be typed, double-spaced and sent to the IWP Conference Planning Department, 1015 N. York Road, Willow Grove, Pa. 19090.

SUMMER SOCIETY FOR COMPUTER SIMULATION (SCS) CONFERENCE '83, Vancouver, B.C., July 11-13.

The SCS is seeking papers that have not been previously published or presented.

A 500-word abstract or a completed draft of the paper should be submitted by Nov. 15 to A.J. Schiewe, 1983 SCS Program Cochairman, The Aerospace Corp., P.O. Box 92957, MS M1/025, Los Angeles, Calif. 90009.

EIS Said Making Way Into Corporate Offices

By Bob Johnson

CW New York Bureau

NEW YORK — Decision support systems (DSS), specifically executive information systems (EIS), are slowly making their way into the offices of corporate presidents and chief executive officers.

That was the impression conveyed by speakers and vendors who participated in a conference on "Practical Approaches to Decision Support Systems for the Corporate Planner." The conference was held here recently by the North American Society for Corporate Planning.

Successful DSS should help the non-DP user and decision maker use data and models to solve semistructured problems, according to Clayton Sundermeyer, manager of decision support applications for the Mead Corp., who spoke about his company's EIS and offered his idea of what allows smooth integration into a company.

DSS are neither traditional transaction-oriented batch systems or "nebulous" artificial intelligence-type systems, but are systems somewhere in between, Sundermeyer said. "The focus of DSS should be on the present and the future, primarily the future. I make a distinction between DSS and traditional systems because many of the batch-oriented systems from previous generations do a good job of summarizing what has happened in the past, but are not terribly action-oriented as we look toward the future.

"That is where the distinction lies concerning good DSS," he said.

Distinction

Sundermeyer also noted the distinction between end-user computing and DSS. "The way we view end-user computing at Mead is that it is the use of products, plans or modeling languages that are sold as DSS generators. These are created by the end-user community itself to develop models and applications which they will use to help plan and manage their businesses as well as other things such as office automation. The key is that they are developing the systems themselves, using themselves as a resource."

Sundermeyer's idea of a DSS is something created by a third party, possibly a DSS group within the company, that is menu-driven, documented and commonly used among many organizational units. It is also data-intensive and practiced corporatelywide.

The DSS must also support the needs of senior management, Sundermeyer noted,

adding that the EIS should enable management to add value to reports and analysis. He also explained that a DSS must contribute to a company's goals and aims and must provide business results.

Donald Heckerman, manager of financial modeling coordination for Mead, elaborated on the company's EIS and how DSS interacts with the executive. He said that EIS at Mead has two main

goals: executive access to current status or projected trends of business and personalized executive analysis.

Mead's EIS has been accepted by the company's president and chief executive officer for a number of reasons, according to Heckerman. When the system was being planned, ease of use, quick information retrieval, graphics capabilities and ergonomic considerations were ex-

plored.

"There were critical success factors that were involved in the installation of our EIS," Heckerman noted. "We had to start small, providing information to a few key members of senior management and seek direct input from them. We also decided to let the system evolve in small precise steps, treating each information need as a unique EIS application, and then de-

veloping each initial application quickly within four to five weeks."

Providing "value" to that information is also important, Heckerman observed. The key value elements are timely access, screening capabilities and graphic capabilities.

Heckerman suggested that an EIS system be "nurtured" into use by fostering daily use.

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The advertisement features a collection of Nashua magnetic media products, including a large 8-inch floppy disk, several 5.25-inch floppy diskettes, and a 5.25-inch hard disk drive, all arranged on a grid background. Below the products, the word "Variance:" is written in a large, stylized font. Underneath this, a complex statistical formula is displayed:

$$V(P/X) = V\left(\sum_{j=1}^K \beta_j X_j + \epsilon\right) = V\left(\sum_{j=1}^K \beta_j X_j\right) + \sigma^2$$

$$= \sum_{j=1}^K X_j^2 V''(\beta_j) + \sum_{j=1}^K \sum_{l=1}^K X_j X_l \text{cov}''(\beta_j, \beta_l) + \sigma^2$$

The formula is presented in a clear, mathematical font, with subscripts and superscripts used to denote the variables and parameters.

Corrects Awkward Structure

Technical Writers Get Help From Editing System

By Paul Gillin
CW Staff

BALTIMORE — Technical editors lament the convoluted styles of some technical writers who turn simple sentences into verbal quagmires. But at Westinghouse Electric Corp.'s Integrated Logistics Support Division here, a mechanized editing system is being tested that not only identifies

awkward word and sentence structure, but suggests alternatives as well.

The system is an enhancement of the Westinghouse Computer-Aided Readability System, which the division has used since 1976. That uses the well-known Flesch and Flesch-Kincaid formulas for military technical materials to check technical manuals for compliance with military specifications for readability.

The basic readability system is a software package designed in-house and stored on floppy disks that are indexed according to the grade level of writing that is desired. The system scans each document as it is entered into Westinghouse's Xerox Corp. 860 word processor and notifies the editor of words and sentences that exceed the Flesch standards for readability.

The readability system is written in Microsoft, Inc.'s Basic and is designed to run on any system with the

Digital Research, Inc. CP/M operating system, according to Westinghouse software developer Edward Pierce.

The readability system not only flags unwieldy words, but includes a substitution dictionary of 900 to 1,000 difficult, nontechnical words with between one and five suggested substitutes, according to Douglas Kniffin, director of the editing project. "Each suggested substitute is shorter in terms of numbers of characters or words than the original phrase," said Kniffin. "It is also a more familiar word."

For example, the system will suggest "admit" or "note" instead of "acknowledge." Or it will offer "usual" instead of "conventional." The dictionary will eventually be expanded to include about 2,000 words, Kniffin said.

Soon to be incorporated on the system will be a phrase substitute dictionary that performs the same function

for 350 common and awkward phrases. "A tendency to" will become "tends," and "at the present time" will become "now."

The mechanization doesn't stop there. If the text still fails to fall within readability guidelines, the dictionary can zero in on abstract nouns and suggest more understandable alternatives.

The research for the mechanized editing system consumed nearly four years of work by Kniffin and Pierce, with editing information drawn from more than 250 books and studies on readability. Although Westinghouse at present has no plans to market the system commercially, Kniffin said the potential for other applications is almost endless.

"Our future plans include an identifier which will convert passive to active voice, a sexual bias check, a paragraph length monitor and controlled logistics vocabularies," Kniffin said. "The controlled vocabularies will contain literally thousands of words which have only one accepted meaning for our work. The system basically matches every word in the document against a computer dictionary."

Similar systems may eventually prove useful in computer-aided translation. "I've done a little work translating English into Spanish and, as a basic, literal translation, the system works quite well," Kniffin said.

Training Meet Set for Houston From Nov. 7-10

HOUSTON — The Data Training '82 conference will be held here Nov. 7-10 for DP trainers, managers, programmers, analysts and consultants.

Sponsored by *Data Training* newspaper, the conference will feature workshops, a training materials exposition, more than 50 concurrent sessions and keynote speeches by Daniel McCracken, author and professor of computer science at City College of New York, and William Raduchel, senior vice-president for information products with Data Resources, Inc.

The conference registration fee is \$385; workshops cost \$75 each. *Data Training* is based at 176 Federal St., Boston, Mass. 02110.

Videotex Directory Published

MENLO PARK, Calif. — A guide to the videotex, teletext, electronic publishing and interactive transaction services industries has been published by Institute for the Future here.

Each section of the 280-page *Videotex Directory* offers extensive information about organizations active in

various segments of these new fields. The guide lists system operators that are running videotex and teletext field trials and commercial services in the U.S., Canada and 25 foreign countries.

The directory costs \$150 from Institute of the Future, 2740 Sand Hill Road, Menlo Park, Calif. 94025.



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CW Photo by S. Blakeman

Text Editing Systems Rapidly Changing Face Of Newspaper Industry

By Jim Bartimo
CW Staff

This story is being written on a CRT terminal. Just like the newspaper stories that are written at 80% of the newspapers in the U.S.

While automation in the news room is not entirely new (1979 figures from the American Newspaper Publishers Association indicate that 21,686 CRT terminals and 2,122 computers were in use among the association's 1,400 members), the proliferation of text editing and transmission hardware is changing the face of the newspaper publishing industry.

"In the large metro dailies, 95% have some kind of system," noted Roy Cundiff of text processing vendor Alex, Inc. "In the smaller papers, which comprise the greatest number of systems, it's about 50%."

Text editing systems at a newspaper like *Computerworld* allow reporters and editors to act as typesetters as well as newsgroomers, cutting out the rekeying process of a typesetter (CW, April 27, 1981). Soft copies of stories are passed from writer to editor and are printed out on a phototypesetter at about 1,000 line/min.

With enough hardware, a newsroom can keep a data base of its past stories, Cundiff said. With the same terminal he uses for writing, a reporter can

save that electronic editing is an improvement over type-writer and paper, he pointed out that the system sometimes creates more work than it saves: "When I worked at the bureau [about five miles away] and the modem went down, I'd have to drive to the main office and rewrite the story."

New technology in the newsroom has led to new products on the newsstand. *The New York Times* and *The Wall Street Journal* both use American Satellite Co.'s digital facsimile satellite communications network to produce national editions. The hometown newspaper chain, Gannett Co., brought out its national newspaper, *U.S.A. Today*, this month on the strength of this new publishing technology.

John Colucci, southeast regional sales manager for American Satellite, explained how a newspaper

written and prepared in Washington, D.C., ends up on newsstands across the country. "The [newspaper's master plates] are prepared at Gannett, and with a laser reader we transmit to receive-only stations."

A laser writer at the regional printers across the country decompresses the bandwidth of the transmission and etches an identical set of plates that are used to print the paper. The plates are etched at each location at the same time, Colucci said.

Color photo negatives, for instance, are transmitted at 153,600 bit/sec, according to American Satellite.

While *U.S.A. Today* is currently distributed in the Washington, D.C.-Baltimore area, transmission to Atlanta, Minneapolis-St. Paul and Pittsburgh, Pa., is scheduled for this month. Gannett expects to penetrate 15 markets by March 1983.

(Continued from Above)
conduct research without leaving his desk.

With so many papers switching to automation, journalism schools are being forced to prepare students for their first day in front of a terminal, even at smaller papers. "We just installed a system last year," said David Klatell, chairman of the journalism department at Boston University. "We had a lot of

people out in the field who came back and said they wish they had training.

"The surprising thing to us is that so many small and medium-size papers have switched over," Klatell said. "Because there are so many smaller, nonunion papers out there, it's easier for them to convert without strikes or layoffs."

But not all reporters are happy with their systems

once they get into the field. A reporter for a central Massachusetts daily who has worked on both a remote and local system in his two years at the paper said, "Our system is terrible. It goes down every other day. We have a lot of trouble with the terminals. The repair guy comes one day and it goes down the next."

Although the reporter, who asked to remain anonymous,



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E-Mail Battle Needs Congressional Help: Study

WASHINGTON, D.C. — The continuing conflict between the U.S. Postal Service (USPS) and commercial vendors of electronic mail/message services will not be solved until Congress acts, the Office of Technology Assessment (OTA) said in a recently released study.

The OTA also predicted that because of increasing competition from the private sector, the Postal Service will

be processing less than its present mail volume "sometime in the 1990s." Two-thirds or more of the current mail stream could be handled electronically, and any significant decline would affect future postal rates.

A key policy issue requiring congressional attention, OTA said, is how the USPS will participate in the provision of electronic mail services in the near and longer

term. Although the Postal Service has been offering Electronic Computer-Originated Mail (Ecom) since January, the service has generated a number of controversial questions, such as whether Ecom is paying its own way.

Among the longer term issues is whether the USPS should be allowed to offer "Generation III" service, possibly by hiring private firms, in rural areas. Ecom is a

"Generation II" service in which messages are transmitted on-line from the sender to each destination post office. The message is

then converted to hard-copy first-class mail and delivered in the usual way. Generation III service would provide on-line delivery to the recipient.

USTS Will Not Raise Rates, Urges Same of Competitors

WASHINGTON, D.C. — U.S. Transmission Systems, Inc. (USTS) does not plan to

raise its rates because of the higher local-exchange access fees recently authorized by the Federal Communications Commission (FCC). USTS will swallow the increase for competitive reasons, a spokeswoman said, suggesting that the competitors will do likewise.

Late last month, the commission raised monthly charges for Exchange Network Facilities for Interstate Access (Enfia) by \$5 and made the increase retroactive to April of this year. As a result, other common carriers such as USTS, MCI Telecommunications Corp. and Southern Pacific Communications Co. (SPCC) must pay AT&T about \$1.5 million.

Enfia charges account for roughly 26 cents of every dollar collected by the other common carriers from their customers, according to Minor Huffman, executive vice-president of the Center for Communications Management, Inc., a telecommunications consulting firm based in Ramsey, N.J.

Enfia rates, which pay for the local loops and local-switching facilities the other common carriers need to terminate their dial-up services, such as MCI's Execunet and Southern Pacific's Sprint offerings, have been the subject of a protracted, acrimonious battle at the FCC. The battle may be settled within the next year if the commission and the combatants — AT&T and the other common carriers — can agree on an overall scheme for assessing access charges for dial-up as well as leased private line services.

September's Enfia decision raised monthly access charges for other common carriers' dial-up services from \$178.46 to \$183.46 per access line.

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errors, as when attempting to place a pen in an already occupied stall.

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For more information on the hard working, friendly and smart DMP-29 plotter, contact Houston Instrument, P.O. Box 15720, Austin, Texas 78761, (512) 835-0900. For rush literature requests, outside Texas call toll free 1-800-531-5205. In Europe, contact Houston Instrument, Rochesterlaan 6, 8240 Gistel, Belgium. Telephone 059/27-74-45.

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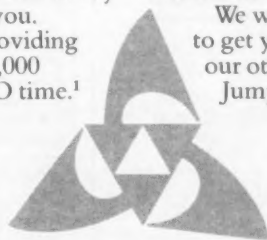
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¹Documentation available from Triangle Software Company

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Even After a Dunking Surveying Firm's System a Hardy Field Worker

HOUSTON — What is found at the bottom of a lake and computes?

For Dwain Blain, the answer to that riddle is a North Star Computers, Inc. Horizon computer.

In Blain's case, a truck carrying the machine accident-

tally slipped into a reservoir of the Rio Grande — along with \$45,000 worth of other seismic exploration equipment — and stayed there for half an hour.

While some of the other equipment did not fare so well, the Horizon was up

and running the next day "as if nothing had happened to it," according to Blain, survey manager for Geoquest Exploration, Inc.

The ill-fated Horizon had not led a pampered life before the dunking. "That Horizon has spent most of its life being hauled over some pretty rough country in the back of a truck," Blain pointed out.

Geoquest contracts with oil and gas companies to survey for resources throughout the southwestern U.S. In the past two years it has purchased five Satellite Positioning Corp. Micro Map turnkey systems for geological survey contractors. Based on a dual floppy disk Horizon microcomputer, Micro Map software translates and plots raw survey data into an X, Y, Z format for interpretation and professional presentation to clients.

Geoquest uses three of the Micro Map systems in the field — where they are transported up to 700 miles by truck to various survey sites, unloaded and set up to work as long as two months at a time in rough, barren terrain.

But life got even rougher than usual for one Horizon last June. One of Blain's crews had parked the truck near their motel room in Zapata, Texas, overlooking the Falcon Reservoir of the Rio Grande.

"They came out a couple minutes later and the truck had rolled into the lake nearby and sunk 12 feet," Blain recalled. "If there hadn't been so much equipment involved, it would have been pretty comical."

The crew was able to pull the truck out within half an hour. It seemed at the time that it was too late to salvage the Horizon; its cardboard box was totally disintegrated and the computer inside, like most of the other equipment, was soaked through, Blain said.

Blain's crew "spent plenty of time that day on the phone with me trying to explain how that truck got into the lake." Reportedly the emergency brake failed while the truck was parked in neutral.

In the meantime, the computer was left to dry in the sun.

That evening the company's computer technician arrived and used Freon to ensure that all the water was dried out. The next day he plugged in the Horizon.

"Would you believe the thing started right up, chugging along as if nothing had happened to it?" Blain asked.

And it's still running. "Since then we've had a really extensive maintenance check done on it, and [the maintenance people] said that there was a minor build-up of rust, but that no parts had to be replaced or repaired," Blain reported.

Other equipment on the truck that day didn't fare as well. "The [Houston Instruments, Inc.] DMP-2 plotter that graphs out the X, Y, Z coordinates ran for three days, but then rusted up completely," Blain noted. "It just didn't move after that."

After being used for a few more weeks on the road after the accident, the Horizon is now in use in Blain's office, but only by virtue of a rotation schedule. It has by no means been put out to pasture, according to Blain, and it will "absolutely" go out on the road again.

"We are using it now to prepare finished, professional-looking reports for our clients to evaluate," he noted. In other words, it puts a final polish on raw data from the

field.

The crews actually enter their distance and angle data and notes directly into a Texas Instruments, Inc. Silent 700 keyboard, Blain explained. The Horizon then converts the data into plot files, runs the plotter and prints out information in neat column format.

"This is a far cry from what clients in this industry used to expect," Blain explained. "Not so long ago notes scratched on sweaty scrap paper with maybe some blood or a bug here and there were not uncommon." Now Geoquest's reports are submitted in a neat binder with professional graphs of "shot points" — the point where dynamite is set off — and existing wells.

The Horizons are also used to ensure the accuracy of survey data. The computer automatically checks the data of the survey site against known landmarks, indicates the percentage of error and adjusts the results if the error is within acceptable margins.



Despite "Delicate Instrument, Handle With Care" warning, a North Star Computers, Inc. Horizon microprocessor, like the one Lindsey Pierce loads onto a truck for Geoquest Exploration, spent half an hour submerged in a lake recently — and survived.

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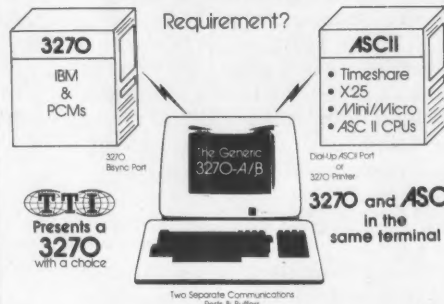
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DPers Seen Stalling Growth Of Users' Training on Micros

By Bob Johnson

CW New York Bureau

NEW YORK — Corporate management information systems (MIS) and DP departments are frequently the biggest stumbling blocks to user training on microcomputers, a Los Angeles computer training specialist contended here recently.

Although many chief executive officers and department managers like the idea of implementing micros to off-load DP work, the DPers are reluctant to endorse user training, said Stephanie Burns, president of Source of Educational Computer Training, Inc. (Sect) in an interview at a conference last month.

One reason professional DPers do not foster computer education for users is that they want to hold on to the "mysticism" that surrounds the computer area, Burns maintained. They feel threatened by the idea of users having too much computer savvy because they fear losing some of their corporate power.

Sect has supplied training for a number of major companies, which Burns said required a great deal of user microcomputer training to boost information productivity sufficiently and to lighten the DP load. She pointed out that uncooperative DPers in these companies are only hastening the inevitable fact that users will have to understand how to use computers.

"It is like the flow of water; users will take the path of least resistance in order to get computer training," she said.

Alienating Mystique

Burns explained that since DP became a driving force within companies, the people in the computer areas were always looked at as having some astounding knowledge, and that mystique alienated them from the rest of the company. She said that this "only kid on the block with the power" attitude made DPers a sort of elite corps to which users could never belong.

This problem is becoming particularly noticeable in the user management ranks, Burns noted, adding that managers are almost afraid to ask the DP department for advice about obtaining a computer, much less trying to learn how to use it.

The microcomputer is necessitating a change however, Burns noted, and advised that MIS and DP professionals need not fear user education, but should, in fact, try to control it. The educator said organizations such as

Design Professionals Get System Directory

DEDHAM, Mass. — The 1983 edition of *Design Computdata*, a directory of automated systems for design professionals, is available from Frank A. Stasiowski, publisher.

The new edition lists hardware, software and complete systems specifically for architects, engineers, planners and contractors.

The directory costs \$95 plus \$3 for postage, payable to Design Computdata, located at 45 Van Brunt Ave., Dedham, Mass. 02026.

hers want DPers to take an active part in teaching users that need training. "We need the DPers to help break down the mysticism," she said.

Burns pointed out that if the MIS and DP areas take the responsibility of disseminating education information to users, they can, in effect, control all the hardware and software purchased and influence how microcomputers will fit into the corporate MIS plan. She added that, hypothetically, in a situation in which microcomputers are needed, the DP department can arrange for users to become part of their network instead of independent and uncontrolled satellites.



CW Photo by B. Johnson

DPers do not foster computer education for users because they want to hold on to the "mysticism" that surrounds the computer area, according to Stephanie Burns.

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Programming Productivity Up Grain Firm Reaps Benefits With Documentation

CHICAGO — The tedious but inescapable task of software documentation is a lot more tolerable and considerably more accurate lately here at Continental Grain Co.'s Industrial Services Group (ISG).

In an effort to reduce the amount of time spent documenting programs, ISG installed a system last July called JCLflow, developed by Consumer Systems of Oak Brook, Ill. The software runs on the company's IBM 3032 system under MVS.

According to William Howe, manager of systems and programming for the company, the system creates application system documentation by using the company's OS JCL as its only input. It is being used to facilitate the transition of test procedures into production turnover documentation, and ISG claims to have realized both speed and accuracy improvements.

"In a structured shop, there exists a high-level demand for documentation," Howe explained. "Often, the last 5% of a project takes 15% of the time allotted, because this is when most of the documentation assembly activities take place."

Setting Up Procedures

The ISG set up two procedures that execute JCLflow: one executes it in a test environment to document procedures as programs are being developed, the other documents the transition from test to production libraries as a part of their turnover documentation.

"This gives our operations group a level of control and assurance of accuracy that it never had before," Howe as-

serted.

JCLflow uses a permanent file that provides cross-indexes of data set, programs and procedures. If at a later time a particular file needs modification, this permanent file shows in which procedures the file is used. Howe found this feature very helpful to his staff.

The product also provides

the ISG operations group with automated flowcharts for each of its procedures, further enabling them to strip off embedded documentation in the procedure libraries.

"JCLflow enhances the use of the procedures libraries as repositories for system and programming documentation. Therefore, it is always

recallable, always updatable and always available," Howe maintained.

Howe said he expects eventually to save up to 10% of program documentation development time in this way.

Presently, the ISG is running all of its production procedures through the JCLflow system to create documentation that will be

permanently retained in the operations department.

"Being able to track accurately where data is coming from has increased Continental's programming productivity... It eliminates the hassle of systems and programming people sitting around drawing time-consuming pictures," Howe concluded.



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Bank Finds Security in Choice of Uniprocessor

BIRMINGHAM, Ala. — Can a leading bank depend on a single computer installation anchored by a lone mainframe? Or should it go with a redundant system employing multiple small computers or at least two large mainframes, as many banks prefer?

This was the choice that the Birmingham National Bank faced four years ago, when it launched several studies to

help it make the right decision on system configurations. The studies showed that a properly designed uniprocessor with adequate memory and communications backup would render a cost-effective solution to the bank's DP needs, especially when compared with a redundant arrangement.

The bank considered other options besides a uniprocessor setup, including the in-

stallation of independent minicomputers scattered throughout various bank offices and the use of remote time-sharing services. One scheme called for a dual-processor configuration using IBM 370/168 machines.

But when the bank began to compare the IBM upgrades against the purchase of an Amdahl Corp. single-processor configuration, it found that "upgrading the dual

158s with the necessary hardware and software to match the processing capability of the Amdahl 470V/6 would cost approximately twice as much as the Amdahl machine," according to Joseph Harlow, the bank's senior vice-president.

The closest alternative single processor considered, the IBM 370/168, would cost over \$1 million more than the 470V/6 for less equiva-

lent power based on comparable million instructions per second rates, bank officials said.

If purchased under the same terms as the Amdahl system, Harlow calculated the monthly operating cost of the 370/168, together with all IBM peripherals, would have been about \$67,000 more per month for the bank.

The bank then decided on the 470V/6 operating under MVS 3.8 with 6M bytes of main memory, more than 15G bytes of disk memory and tape backup systems.

Using the standard CICS software communications package, the Amdahl processor supports a network coordinated by an Amdahl 4705 communications processor. Workstations at each location range from minicomputers serving as subsidiary nodes for local terminals to advanced intelligent terminals at low-volume offices.

Two Remote Sites

Communicating with the central system are two remote sites where 4705s support check collection and capture functions for smaller banks located nearby.

Total transaction volume includes nine million checks per month at the main bank, three million at the two remote capture locations and 2.5 million from other remote locations linked directly to the central office.

"A decision in favor of a single-processor configuration today would be easier than it was four years ago, both in terms of cost and capability," Harlow said. "Four years ago, prices were generally much higher for CPUs, memory and peripherals. From purely a cost point of view, it would be a bad business decision to continue using a dual or multiprocessor scheme when single processors of equal reliability are available at much lower cost."

Since the bank switched to the Amdahl configuration, there have been "only three or four outages of any significance, ranging from four to 10 hours in duration," Harlow remarked. "The most serious outage, which caused us to miss our Federal Reserve deadlines, cost us less than \$3,000 in interest."

Harlow concluded, "One shouldn't look only at the CPU but examine configuration peripherals as well. The best way to increase savings is to incorporate the best quality but lowest cost peripherals available on the market. Whether one should mix peripherals from different vendors depends on vendor service philosophy."

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State of Oklahoma Wraps Up MIS Chores With Indexing Tool

OKLAHOMA CITY — State revenues. Taxes. Automobile licenses. Vehicle registrations.

These may not be exciting topics, but they are part of the financial underpinnings of most states. And here in Oklahoma City, these chores fall under the responsibility of the Management Informa-

tion Systems (MIS) Division of the State of Oklahoma's Tax Commission here.

Presently, the state's motor vehicle file consists of some four million records, according to Clarke Easter, manager of technical support in MIS.

This file requires CICS inquiry, update and add capa-

bilities on an on-going, round-the-clock basis to support the National Law Enforcement Teleprocessing System, Oklahoma Tag Agent Network, Motor Vehicle Division and data entry, Easter explained.

Rebuilding Problem

"The problem we had faced for some time was how — on an as-needed basis — could we rebuild the alternate indexes in an efficient and timely manner with the least amount of interruption to our subscribers?" Easter commented.

The only capability until then had been with IBM's Access Method Services' Blindex and Alter commands, used on the department's IBM 370 system. Easter lamented that these options made the files inaccessible from six to eight hours per alternate index, required MIS to define additional Vsam sort work space by specifying magnetic disk devices, allowed only two external sort work files when not enough storage was provided for an internal sort and required separate reads of the base cluster for each alternate index being built.

"Due to our limited hardware capabilities and file requirements, Blindex was becoming an almost impossible provider."

Solution Found

In September 1981, Easter found Vsam Quick-Index from Softworks, Inc. in Clinton, Md. "This software has been written with speed and efficiency in mind and has

Firm Publishes Five Monthlies On Automation

NEW YORK — The Automation Systems Research Group has added five monthly reports to its line of publications aimed at the industrial automation market.

The newly announced publications are *Industrial Automation Executive Report* (which costs \$100 a year), *Industrial Automation Labor Report* (\$95 a year), *Industrial Automation Robotics CAD/CAM Design and Engineering Report* (\$135 a year), *Industrial Automation Robotics CAD/CAM User Report* (\$95) and *Industrial Automation Institutional Investment Report* (\$150), the firm said.

The firm said the reports focus on the individual aspects, trends and developments of their respective areas. The firm is located at Suite 1800, 41 E. 42nd St., New York, N.Y. 10017.

IBM Conversion Seminar Scheduled for Nov. 1

PALM SPRINGS, Calif. — Converting to IBM's recently announced extended addressing operating systems, MVS/XA and VM/XA, will be the subject of a seminar scheduled Nov. 1-3 at the Hilton Riviera Conference Center here. The seminar is being held by Enterprise Information Systems, Inc., a Greenwich, Conn.-based consulting firm.

The three-day event will consider the problems that users may encounter in converting from IBM's current 24-bit addressing architecture to the 31-bit addressing architecture allowed under the extended addressing operating systems. The operating systems were announced by IBM two years ago; first commercial deliveries of the systems software are scheduled for the first quarter of 1983.

Speakers will include Richard H. Williams, vice-president of IBM's Data Systems Division, and John Mangold, an executive in Amdahl Corp.'s Software Products Division.

The attendance fee for the seminar is \$700. Enterprise Information Systems can be reached through P.O. Box 1154, Greenwich, Conn. 06836.

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Firm's Users Control Application Design

LOWELL, Mass. — If the users' requirements are not communicated clearly to programmers during a development effort, applications that are "technically beautiful" can be rejected because an important element or two is missing.

That is what Richard G.H. Harris, vice-president of management systems for the Colonial Gas Co., kept in mind when the firm decided to broaden its DP capabilities and permit an early development of applications. The solution was the installation of a Sperry Univac 1100/60

computer and Mapper, an interactive nonprocedural system designed to give users full control over their programs from the beginning of the development cycle.

According to Harris, Mapper employs a "user-friendly language" which enables Colonial's programmers to develop computer applications on-line and without intermediaries. He sees it as a means to "break out of the [traditional] systems development cycle and all its entails." In turn, he expects this to lead to a 5:1 ratio improvement in development and

maintenance productivity over conventional methods.

Colonial installed a Univac 9480 in 1975 to establish a customer information system. Until then, its Lowell Gas Division, which had 50,000 customers, and its Cape Cod Division, with 40,000 customers, had a manual key-driven system to generate bills and maintain accounts. Harris said this was a good system for his inexperienced staff. However, the decision was based on the availability of an on-line customer information system which previously was developed by one of Sperry Univac's utility customers.

Harris' staff now has grown to 11 people. The majority of these people have been trained in-house over the years. In 1978, Colonial installed a Univac 90/60 to try to improve cost/performance and went on-line with general ledger, financial and time-reporting systems. Files were updated on-line while the processing was done at night.

Possible Solution

In 1980, Harris said he was faced with "too many applications to develop using the standard development cycle." He perceived Sperry's Mapper package as a possible solution. "In theory, Mapper looked good," he recalled. Before making a formal commitment, Harris put the the-



A.P. Rounds, manager of customer accounting and collections for Colonial Gas Co., analyzes collection agency activity in an interactive mode. Rounds is one of several users who have developed their own applications using the terminal on-line to the mainframe.

ory to a test. Sitting with an experienced Mapper programmer, he was able to develop a working prototype of an on-line inventory control system in two days, he said.

Early in 1981, Colonial installed the Sperry Univac 1100/60 and began converting the complex customer information system to Mapper. The system has a 90M-byte record data base, handles at least 200,000 transactions per month and coordinates interdepartmental activity among four or five user groups that include credit, service and accounting.

Harris is not particularly

concerned about users developing their own systems with Mapper. Making mistakes is often an essential part of the learning process, he observed.

"You can do it with Mapper in a controlled environment established by the management systems staff," he explained. "We define the ball park they play in, and they do not interfere with the other games going on. Then, as they become more sophisticated, they are given more resources."

Even though Harris' staff concentrated most of its effort on converting the customer information system, users are being encouraged to develop their own applications. For example, one put a 200-vehicle maintenance system on-line, while another created a labor productivity application in a few months. The manager of customer accounting and collections developed a system to control and analyze collection agency activity and he is redesigning the customer bill in an interactive mode on the computer.

"In the normal course of events with our work load, we would not have gotten to these," Harris said. "We work on corporate priorities, and some systems with departmental impact, but limited corporate impact, could very well be bypassed altogether."

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Terminals Now Part of Daily Routine

MIS Head Overcomes Executives' Resistance

SYLMAR, Calif. — Although Ruben Espinoza knew that many executives are wary of computers, he went ahead last year and installed two terminals in the executive offices here at Fortin Laminating Corp. The terminals were connected to the firm's new minicomputer.

The reason why Espinoza — who was recently appointed director of management information systems (MIS) — put the terminals into executive offices was to prove a point: Computers can be accessed by anyone who needs information.

"In a short time, the executives began to ask questions," he said. "Now it has become a daily ritual for many executives to use the computer to satisfy some of their information needs."

The successful installation of the minicomputer — a Hewlett-Packard Co. 3000 Series 44 — was a happy ending to what began as a sticky DP problem for Fortin two years ago.

No Time to Plan

Fortin, a manufacturer of laminates for printed-circuit boards, had installed an IBM System 3 in 1976, but rapidly outgrew its limited capabilities. However, the company's DP department was too busy fighting fires to do the legwork necessary to plan and install a new system, Espinoza said.

In early 1980, Fortin ordered an IBM System/38, but scrapped the idea when the vendor pushed back delivery dates by several months. At that time, HP stepped in and convinced company management that an HP 3000 would fit their needs. After a cost analysis was completed, Fortin ordered the system for installation that summer.

The system consists of the HP 3000/44 with 2M bytes of main memory, four 120M-byte disk drives, 32 terminals and six printers. Fortin employs 600 people at 10 locations in the Sylmar area.

The company then retained Trident Data Systems, Inc., a software development and management consulting firm based in Los Angeles, to supervise the installation. For the next nine months, a team of two Trident consultants worked with Fortin management to install a complete manufacturing management system and to put other functions — including order entry, accounts receivable, accounts payable, personnel, production control, projections and work-in-progress

tracking on-line across the 10 facilities.

"Frankly, their DP department was in bad shape," said Fred Lukas, president of Trident. "They had an inadequate IBM and a very small staff organized under the finance department. They had no idea of where they wanted to go with the new system."

The first hurdle to overcome, according to Espinoza, was the tendency of employees to resist change. Trident pinpointed areas that would see the immediate benefits of automation and advised the company to begin introducing small improvements that would bring big benefits.

The consultants then recommended that the DP func-

tion be immediately elevated to the vice-presidential level in order to establish its importance in the organization. Most importantly, according to Espinoza, the consultants drafted a report containing 13 recommendations for management to consider in implementing the computerized system. Foremost among them, Espinoza said,

was advice that the company install a manufacturing management system to control inventory and track production. The results, he added, have been dramatic.

"The computer has helped tremendously in inventory control," he said. "We are no longer ordering based on a gut feeling, but rather on projections and figures."

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U.S. Olympic Lab's Micro Coach Aids Athletes

COLORADO SPRINGS, Colo. — One of the best coaches on the 1984 U.S. Olympic team never ran a mile, skied a grueling slalom or lifted weights. That coach is a microcomputer that has been programmed to watch athletes and tell them how to improve their techniques.

The U.S. Olympic Committee's biomechanics laboratory, part of the organization's Sports Medicine Division here, has been using Apple Computer, Inc. Apple II microcomputers connected to force platforms and LEDs to study how athletes move. The systems can often be used to suggest ways the athlete can become even better at his sport.

"We are not using technology to replace the coach, but to give him an additional set of tools," noted Larry Taylor, an electronics technician in charge of the sports program. The microcomputers are basically used to draw attention to factors that are too subtle for the unaided eye to detect, yet which may have a significant bearing on an athlete's performance, Taylor explained.

Two Cameras

During actual sporting events, athletes are filmed by two cameras located at different angles. That information can be digitized and entered into a computer, in this case a Data General Corp. Model S250 Eclipse processor, to generate a three-dimensional image of the athlete.

"This is a highly useful technique," Taylor said, "but it has the obvious drawback of a prolonged lag-time between the actual performance and the digitized results. We wanted to augment it with a real-time system that provided immediate graphics feedback."

The solution was to use Apple IIs connected to graphics plotters developed by Alphacom, Inc. Using specialized software, the system can analyze a variety of sports, including skiing, race walking, rifle shooting, archery and weight lifting, Taylor said.

The system is used in one of two ways. For sports like archery or weight lifting — where the participant tends to stand in one place — the laboratory uses a force platform to evaluate the athlete's movements. The platform contains sensors that can pick up the direction and force of the athlete's stance, convert that analog information to a digital format and enter it into the processor. The information is then put into a graphics format that is printed for evaluation by the

athletes and coaches, Taylor said.

For sports where a force platform is impractical, such as skiing, the researchers use LEDs and a specialized camera to evaluate athletes' performances. To measure this type of movement, the lab places LEDs that blink 300 times per second on the knee and ankle of one leg. The

camera integrates a photocell that translates the position of each diode to X-Y coordinates, which it feeds to the microcomputers. Using this data, the processor plots the angle over the time of the jump and outputs to the printer, Taylor said.

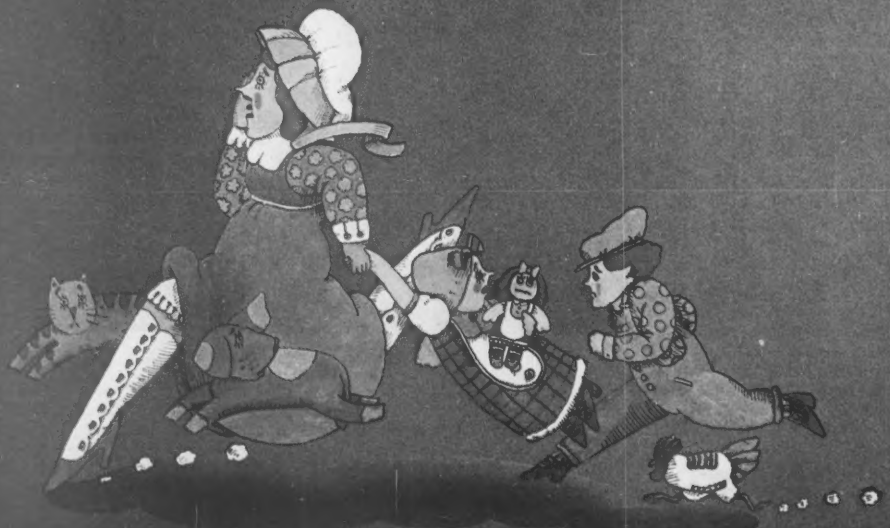
Taylor emphasized, however, that the suggestions that can be developed by using

the Apple II aren't always best. Some of the top athletes have very unique movements that, according to the computerized analysis, are inefficient. Biomechanics research can only suggest ways athletes can potentially improve their performance. However, sometimes those theories do not hold true in actual practice, Taylor ob-

served.

The U.S. is not alone in using biomechanics to improve athletes' performance. The USSR, for example, has been using biomechanics since the early '60s and East Germany has established a very sophisticated biomechanical engineering facility that is used as part of its regular training program.

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Vehicle System Keeps Utility Service Rolling

NEW YORK — Trucks may move computers, but in the New York City area Consolidated Edison is using computers to keep its fleet of trucks moving efficiently with lower maintenance and fuel costs.

Con Ed serves electricity, gas and steam customers throughout a 660-square-mile area covering the five boroughs of New York City plus most of Westchester

County. About 340 people in 17 garages maintain the firm's fleet of 2,500 passenger vehicles and light trucks and 2,700 heavy-duty trucks, specialty vehicles and equipment.

Two years ago, Con Ed made use of a batch-type service bureau for its monthly reporting, an in-house batch reporting system and some time-sharing systems used by company personnel.

The old batch systems gave after-the-fact information, had a relatively high error rate and, while they produced many transaction listings, they provided few operational, exception and comparative reports.

Users' level of confidence in the reports was not high and the information left something to be desired in fleet management, according to David Bosland, the firm's

assistant vice-president.

"We wanted useful information at the shop level," Bosland said. "From the very beginning of project development, the users were asked to provide the design criteria that would make the system responsive to their special requirements."

Former limitations have been solved through the use of real-time entry, editing and updating, as well as

prompt display of responses to short inquiries and immediate printing of short operational documents. Longer documents are prepared overnight.

Special Package

IBM's Vehicle Management System (VMS), installed in mid-1980, links IBM CRT terminals and printers at the 17 garages and various administrative locations with an IBM 3033 processor at the utility's headquarters in Manhattan.

The CRT terminals are used to enter a variety of transactions, either to obtain information from the central computer's data base or to update records. For example, when vehicles undergo maintenance at the garages, labor and materials information immediately updates the central data base that also contains labor and repair history and stock balances.

In turn, various reports, such as vehicle repair histories and material requisitions, are printed at the garages for use in daily maintenance operations.

Maintenance histories, printed at garages where new jobs are initiated, help supervisors and mechanics catch repetitive maintenance problems and diagnose malfunctions. Out-of-service reports help management and foremen plan their work and keep better track of maintenance activities.

"I review the out-of-service report for the Astoria garage each morning," explained Leonard Wheat, Con Ed's general manager of transportation. "First I check the total number of vehicles that need service to determine the trend."

"Then I check the status of each vehicle, review the cause for any delayed service and take appropriate action," Wheat added. "Since VMS has been installed, I've observed that the average number of vehicles awaiting service at the Astoria garage has been significantly reduced."

As for fuel savings, the system records and accounts for virtually 100% of fuel dispensing transactions, either by using computerized fuel dispensing systems or by keying in data for display terminals.

In addition, oil and gas usage reports help in determining when steps such as more frequent tune-ups should be taken to correct poorly functioning vehicles and in evaluating oil and gas usage by vehicle types and classes.

Future expansion of the VMS system is expected to include vehicle accident and repair monitoring and further statistical analysis of fuel usage trends.

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Police Department Puts the Arm on Waste

MOBILE, Ala. — Crime may not pay, but computers do for the Mobile Police Department where, since 1975, a computer has increased efficiency without adding personnel.

It was in recognition of population and economic growth in the Mobile area in the early '70s that Police Commissioner Robert B. Doyle Jr. started anticipating a possible increase in crime rates.

Doyle's thoughts turned to computer power as an economical adjunct to man power. "Law enforcement has evolved into a complex science concerned with more than simply preventing and solving crime," Doyle observed.

"It also involves using creative tools, like computers, that might not

be considered part of the typical police arsenal," he noted. "And at a time of restricted police budgets, it also requires using procedures that are effective without being expensive," he added.

First Computer

In 1974, Doyle used federal funds from the Law Enforcement Assistance Agency to acquire the department's first computer. But actually buying a machine was not a simple matter. "We learned that buying a computer involved more than accepting competitive bids," Doyle noted.

"We had to find a system that not only met our present and future needs, but also satisfied the federal

guidelines relative to purchase price and compatibility with other state and federal computer centers," he recalled.

To learn how computers operated within law enforcement agencies, Doyle visited other computerized police departments, studied their configurations, programs, system flexibility and considered how adaptable each computer might be to the needs of the Mobile department.

After considering proposals from a number of vendors, the Mobile Police Commission selected a refurbished Honeywell, Inc. Series 3200 system that is still in operation today.

The Mobile Police Department has tried to use the computer as an effective, yet inexpensive, tool for law en-

forcement. The Honeywell system executes a program called Mobile Area Law Enforcement System, which Honeywell helped to develop



Robert B. Doyle Jr., the police commissioner of Mobile, has found his computer system more than just an effective crime fighter — it's also a money saver.

to make Doyle's existing staff more effective and to save money by streamlining tasks that once were time consuming or inefficient.

"For example, we use our computer to analyze types of crime by geographic location," Doyle pointed out. "This information indicates where we need to add officers to the patrol or where we can use fewer cars and still provide effective protection."

"Most importantly, when officers in the field need fast access to crucial information, they get it from the computer anytime they need it," he said.

"Let's say we receive a stolen car report," Rod Steade, a detective with the Mobile staff, suggested. "We have a description of a dark green 1976 Chevy Nova, for example, that's been stolen from a shopping center parking lot," he continued.

"If an officer stops a car of that description, he can use his radio to relay the tag [license plate number] and serial number or other vehicle or operator information to a dispatcher at police headquarters, who then enters the data into the computer," Steade added.

"Within seconds, the system determines whether or not the car in question is the stolen vehicle. We even can check if the tag is stolen or if perhaps the driver is a suspect in any other case," he said.

Stores Records

In addition, the Honeywell computer stores all departmental personnel and administrative records.

The computer network is not limited to the Mobile area. The Honeywell computer is linked to the statewide Alabama Criminal Justice Information System in Montgomery and to the National Crime Information Center in Washington, D.C.

This network gives Mobile officers information needed to apprehend a suspect or take custody of stolen property within their jurisdiction from anywhere in the country.



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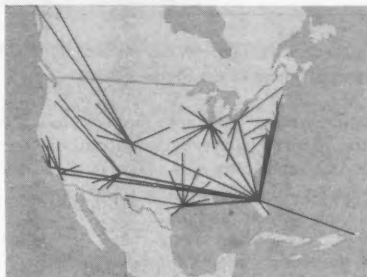
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Computer-Based Dispatching Assists Police

OVERLAND PARK, Kan. — A police officer can't prevent a crime or catch a criminal if he isn't there. Fortunately, computer-based dispatching systems have made the job of getting there a lot easier.

Here, in this Kansas City suburb of 83,000, police use such a system to dispatch calls. The system is based on an IBM 4331 processor with 3M bytes of main memory and has three IBM 3270 color terminals and one standard CRT unit. The system also includes an IBM 3287 printer that is dedicated to the dispatching effort, according to Ken Rodney, the department's data processing manager. The system has almost totally elimi-

nated the need for writing down information from a call, said Capt. Gus Ramirez, head of the dispatching operation. Before installing the system, complaint operators used paper cards, which in some cases required as many as 27 handwritten notations to record complaint information. The cards were then funneled through to the dispatcher who would assign an officer to cover the complaint.

Now, Ramirez said, operators can get vital information to the dispatcher much faster. For example, if someone reports a robbery the operator can immediately send preliminary information, such as the location of the crime, to the dispatcher. The op-

erator can then keep the caller on the phone to get more details about the situation, which are then relayed to the responding officers.

But the biggest advantage, Ramirez continued, is that the dispatcher can call the complaint file on an IBM 3278 color CRT screen to answer any questions the responding officer might have. Before the system was installed the dispatcher had to leave his desk to check a complaint file, which was located in another part of the office.

Atlanta

In Atlanta, that city's police department uses two IBM 3031 processors

to dispatch its officers. One of the processors is dedicated to police, fire and other services. Not only does the processor handle about 800,000 calls a year, it also helps police plan officers' beats and prepare budgets, according to Atlanta Police Commissioner George Napper.

Police dispatchers in Atlanta, Napper said, have access to enough information to assign one or more police units to a call.

For example, by checking one of nearly 300 terminals at the department, dispatchers can determine which units are available. They can then key in the number of the unit sent to the scene.

Once the cruiser arrives at the location and notifies headquarters, the dispatcher keys in another code and the system automatically shifts the unit's classification from "en route" to "at scene." After the complaint has been answered and the unit is ready to accept another assignment, the dispatcher enters another code to indicate an "available" status, Napper explained.

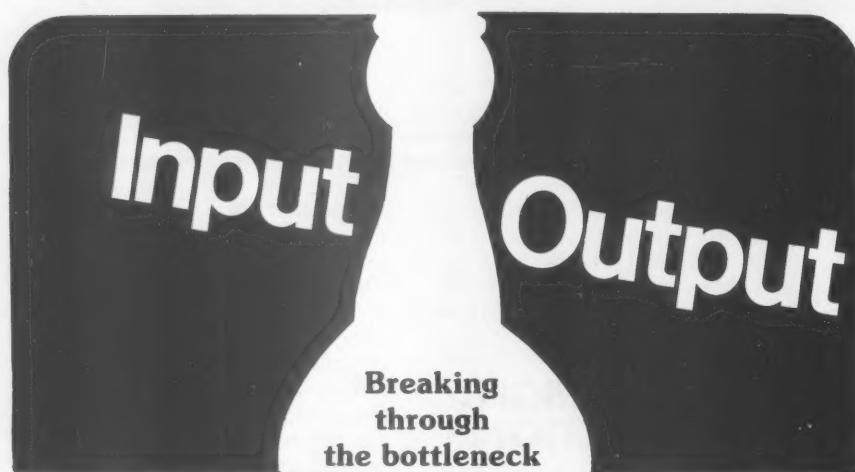
Another feature of the system that Napper said is helpful is an incident report screen which, at the request of the terminal operator, gives a detailed account of the history of a call including the units sent, the times they were dispatched, when they arrived at the scene and when they cleared the call.

ICCCM Slated For April 18 In New Orleans

NEW ORLEANS — The Institute for Software Engineering will host its Fifth Annual International Conference on Computer Capacity Management (ICCCM) here April 18-21.

Intended for DP professionals and senior corporate management, the ICCCM will focus on the need for effective management information systems management. Prof. John F. Rockart, director of the Center for Information Systems Research at MIT's Sloan School of Management, will discuss "Critical Success Factors in Information Systems Management" at the keynote presentation.

Registration for this event costs \$445 for nonmembers, \$345 for institute members and covers conference proceedings, luncheons and receptions. Further details are available from the institute at 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.



A powerful CPU is like a clever mind. Neither realizes its full potential without the ability to listen and reply. I/O bottlenecks stifle the responsiveness of any good system.

In the *Computerworld* November 29th Special Report on "Computer Input/Output," you'll read how to get more I/O for the dollar. Editor Tom Henkel has gathered material from experts involved with all the latest techniques in data entry; from networking to the use of micros, from voice to videotext. You'll get articles and tutorials on using COM, optical character recognition, demand deposit accounting systems, and more.

According to International Data Corporation, the world's largest computer industry research firm, the hottest area in the output side of the market is in printers because of the success of desktops, most of which have one printer per system. At this low end, in the business/professional segment of the desktop market alone, 301,000 printers were shipped in the U.S. in 1981. There were 773,000 total printers (not including high-end electronic typewriters) shipped in the U.S. in '81. On the input side, CRT's are the hottest market segment with more than 1,088,000 CRTs shipped in the U.S. in 1981.

Keeping up with this market is vital to the success of any operation, and this November 29th — you'll be brought up to date. And if you sell to buyers in the I/O marketplace, you'll want your ad where your buyers are — reading "Computer Input/Output" in our November 29th issue. Ad deadline is November 12th. Call your *Computerworld* sales representative listed below, or, for more information call Don Fagan, Vice President, Sales, at (617) 879-0700.

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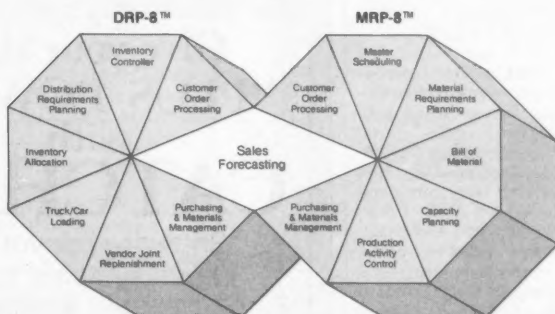
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Management Technique

'Quality Circle' Eases Product Development

By Howard Smith
Special to CW

It is a little ironic that a management technique developed and abandoned in the U.S. has been adopted and applied by the Japanese with spectacular results. It is even more ironic that U.S. companies are slowly rediscovering what they had founded in the first place.

The tool in question is the "quality circle," wherein workers are actively involved in solving production problems that affect the quality of the final product.

I first became aware of quality circles through various articles and then through a trip to Japan with other Hewlett-Packard Co. managers. What we saw in terms of quality circle accomplishments was enough to make the most accomplished manager take interest.

At Yokogawa-Hewlett-Packard (YHP), for example, the development cycle (length of time from initial concept to finished product) was 18 months as compared to the usual two years. YHP also boasted the lowest warranty costs in the company, as well as the highest reliability ratios for its products.

Elsewhere, results were equally impressive. One company that we visited had increased its production at a rate of 13% a year for five straight years.

In addition to the tangible results in terms of productivity and quality, membership in a group seemed to foster a problem-solving awareness among employees. The large

percentage of solutions originating with the workers themselves also convinced me that quality circles might be helpful in research and development at HP.

Special R&D Problems

Impressive as the results were, I was not sure how the quality circle concept would apply in an R&D laboratory producing computer software. Even in Japan, quality circles were primarily a tool for the manufacturing environment.

In spite of these cultural and environmental problems, it seemed worthwhile to re-establish quality circles in the U.S. In 1979, the HP Computer Systems Division (CSY) software lab established five quality control circles. These quality circles addressed problems in computer languages, data communications, operating systems and programming tools.

Three years and several variations of quality circles later, we have learned that it is a valuable tool in an R&D environment. It is also flexible, and we have been able to mold it to our specific needs.

Quality Circles in R&D

After going through a period of refinement and regrouping, three operative quality circles have been established at CSY, with two more in the process of formation.

Perhaps the most important lesson learned from this evolution is that the manufacturing quality circle cannot

be imposed upon the laboratory environment, but instead must be restructured and redefined to meet an entirely different set of needs.

For example, it must be recognized that the manufacturing quality circle is more stable than the R&D quality circle. The particulars in manufacturing remain basically the same, while the particulars in an R&D setting are constantly changing.

As a result, quality circles tend to fade away and reconstitute themselves around a different set of problems with some frequency. Our first reaction when a circle disbanded was one of minor panic — we must have failed. Now, we realize that this is simply the nature of a quality circle in our environment.

Management's Role

Over the past three years, we have learned that management must take a more active role in starting quality circles and must be supportive and involved once a circle is established.

Our approach is to have the department managers act as the steering committee for quality circles in the lab. This committee sets policy, arranges training and reviews issues being addressed by the circles.

We have experimented with other ways of getting managers directly involved (for instance, as members of the circles, asking people to serve on quality circle's vs. using volunteers only, and so on). If a method isn't fruitful, we drop it.

A key factor in the manager's participation is the ability to foster a high degree of interest in the project. We have identified four methods that seem to be effective motivating factors in the software environment.

- The issues the quality circle addresses must be high on both the laboratory's and quality circle's list of priorities. Perhaps the best example of this — and one of our top accomplishments — is the programming standard that was developed by one of our quality circles. There was hardly any area or any worker who would not stand to gain a great deal with the establishment of a standard.

- Make sure that the problem can be solved within the quality circle group. One original group proved unworkable because it chose to address problems that were too broad. As a result, specific goals could not be achieved.

Through experimentation, we have found that the

group members should be selected from a formal organization consisting of 25 to 35 people. Problems addressed should be those faced by the organization and solvable by the quality circle.

- Establish a relatively short timeframe for accomplishing objectives. Success should be realized within three months at the most.

- Publicize or reward success. This can be tricky in an R&D environment. The key is to provide both peer group and management recognition. The management recognition is easy in that it is provided through our formal reward system (comments on evaluations, factors in raises and promotions, presentations to the steering committee and so on.)

The peer group recognition is provided through presentations to the entire lab and to other departments. We attach a quality circle sticker (where possible) to quality circle-implemented improvements. Also, successes are publicized through the division's newsletter on quality.

The time devoted to the quality circle poses a sticky problem in the R&D setting. In the traditional manufacturing environment, a specified amount of time is set aside each week for quality circle work. In the laboratory, where work is assigned on a project rather than hourly basis, and where a close tie may exist between quality circle work and the solution to a particular problem within a project, time be-

comes a hazy concept.

The answer is not to place time constraints, but to make it clear to the employee the priority of quality circle activity and his or her project assignment. Clearing up these priorities is one of the major reasons to have the department managers involved in the steering committee.

It is also important that quality circle work not be viewed as an additional job load, but rather as an activity that will produce a specific result allowing quality circle members to do their jobs more effectively or result in a better product.

The key here is to make sure that the problem being attacked does in fact come from the quality circle members and that they are not merely acting out something that they believe management wants.

Achievements to Date

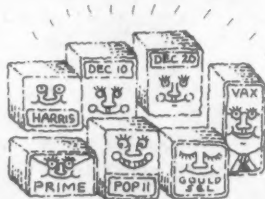
In addition to the programming standard, which has proven highly successful, a technical manuals library has also been established by quality circle groups. The need arose from difficulties people had in locating appropriate manuals when needed, since manuals tended to float around the lab. The technical manuals library has not only made life easier on workers, but is also cutting down on nonproductive employee time.

Howard Smith is the engineering manager for the Operating Systems Lab at Hewlett-Packard's Computer Systems Division in Cupertino, Calif.

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by Aaron Goldberg
of IDC which
appeared in *Computerworld's*
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Now that the computer age is in full stride, 100% availability is fast changing from a luxury to a necessity. Downtime and its costs are unacceptable, especially when there is an alternative. Now that fault tolerant operation is becoming a universal requirement, there is demand for an improvement over the software approach used by Tandem. These computers must provide better performance, be easier to use, be easier to program and re-program, be less complicated and less expensive. We believe that the Stratus hardware based fault tolerant system answers these demands. Let us explain.

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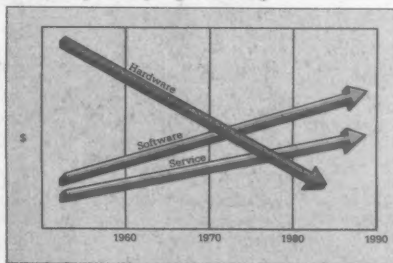
Stratus, meanwhile, has eliminated all this reliability software by having duplicate hardware components tightly coupled, dedicated to performing the same tasks at the same time. It's like having two computers in one, rather than two separate computers. Checking hardware logic detects errors with no performance loss and stops failing components instantly. The duplicate partner continues without interruption, unaffected



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Oct. 28-29, Dallas — **Data Administration: Successful Techniques.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Oct. 28-29, Boston — **International Conference on Office Work & New Technology.** Contact: International Conference, Working Women Education Fund, 1224 Huron Road, Third Floor, Cleveland, Ohio 44115.

Oct. 28-29, New York — **Selecting and Planning Data Base Projects.** Contact: Performance Development Corp., 1101 State Road, Building N, Princeton, N.J. 08540.

Oct. 28-29, Houston — **Protecting Your Information Resource.** Contact: Performance Development Corp., 1101 State Road, Building N, Princeton, N.J. 08540.

Oct. 28-30, Monterey, Calif. — **CAD/CAM Executive Seminar.** Contact: Computer Technology Group, 310 S. Michigan Ave., Chicago, Ill. 60604.

Oct. 28-31, Washington, D.C. — **Mid-Atlantic Computer Show & Office Equipment Exposition.** Contact: Computer Expositions, Inc., P.O. Box 3315, Annapolis, Md. 21403.

Oct. 29-31, Dallas — **The Usus Pascal System Users' Society Semiannual Conference.** Contact: Usus, P.O. Box 11248, La Jolla, Calif. 92038.

Oct. 30-Nov. 2, Washington, D.C. — **Sixth Annual Symposium on Computer Applications in Medical Care.** Contact: Office of Continuing Medical Education, George Washington University Medical Center, 2300 K St. N.W., Washington, D.C. 20037.

Oct. 31-Nov. 3, Barcelona, Spain — **Integrating Payment Systems: A European Perspective.** Contact: William M. Moore, Senior Vice-President, Payment Systems, Inc., 100 Peachtree St., Atlanta, Ga. 30303.

Nov. 1-2, St. Louis — **Software: A Legal Briefing for DP Professionals.** Contact: American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940.

Nov. 1-2, Anaheim, Calif. — **Robotics and Artificial Intelligence.** Contact: Technology Transfer Society, Suite 1016, P.O. Box 91295, 5959 W. Century Blvd., Los Angeles, Calif. 90009.

Nov. 1-2, Boston — **Software Engineering Economics.** Contact: Education Foundation of the Data Processing Management Association,

P.O. Box 91295, 5959 W. Century Blvd., Los Angeles, Calif. 90009.

Nov. 1-2, Boston — **Networking, Protocols and Standards.** Contact: Seminar Dept., Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 1-2, Los Angeles — **Performance Seminars — MVS, IMS and CICS.** Contact: Candle Corp., Suite 2404, 10880 Wilshire Blvd.,

Los Angeles, Calif. 90024.

Nov. 1-2, Orlando, Fla. — **Managing Software Projects II.** Contact: Education Foundation of the Data Processing Management Association, P.O. 91295, 5959 W. Century Blvd., Los Angeles, Calif. 90009.

Nov. 1-2, New York — **An Executive Briefing: "Computers — Can You Afford Not to Understand?"** Contact: Registrar, Arthur An-

dersen & Co., Center for Professional Education, 69 W. Washington St., Chicago, Ill. 60602.

Nov. 1-3, Los Angeles — **DP Disaster Recovery Seminar.** Contact: EDP Security, 181 West St., Waltham, Mass. 02154.

Nov. 1-3, San Francisco — **Teleprocessing Software: An Introduction to Concepts and Systems.** Contact: Seminar Department, Data-

pro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

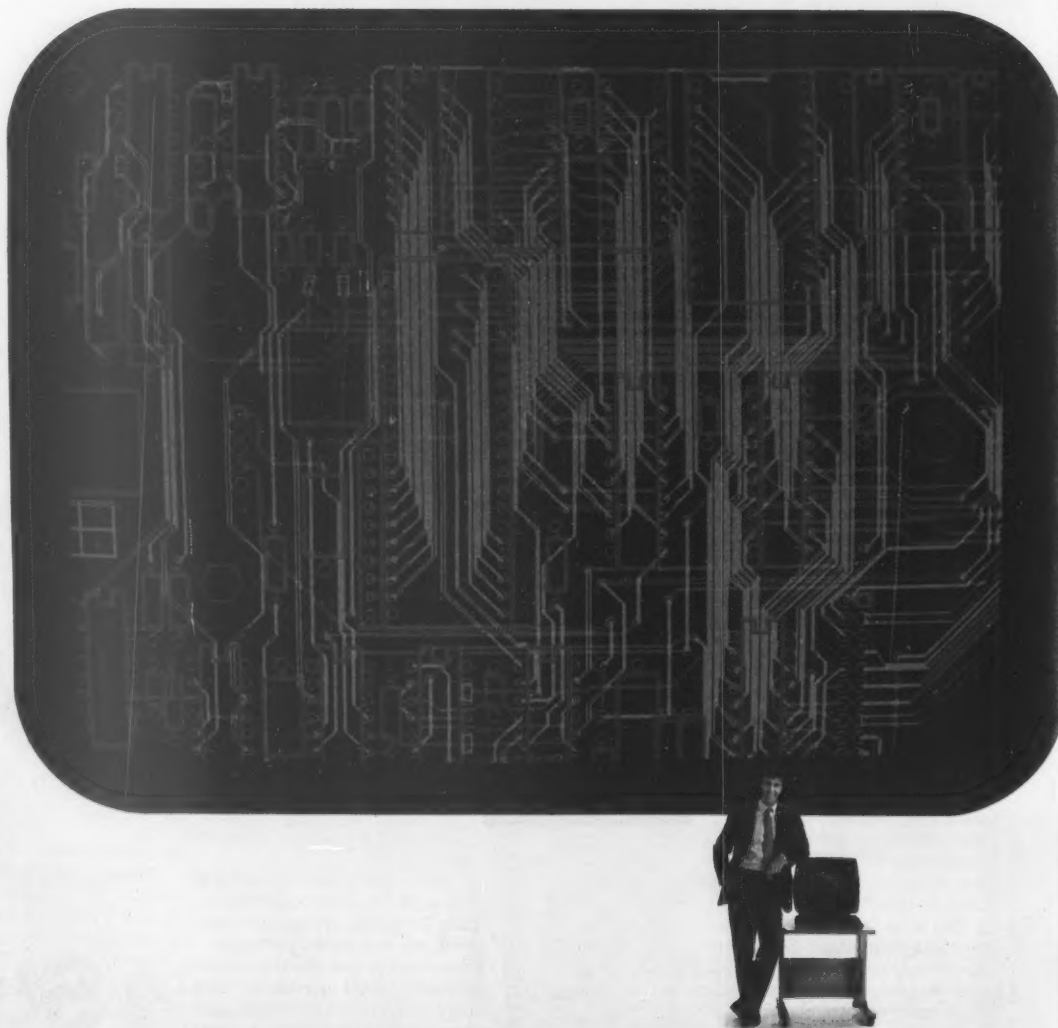
Nov. 1-3, Dallas — **Planning for Computer Usage in the Design Office.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 1-3, Washington, D.C. — **IBM Data Dictionary.** Contact: Data Base Management, Inc., 281 Hartford Tnpk., Vernon, Conn. 06066.

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Nov. 1-3, Washington, D.C. — **Data Dictionaries: Concepts, Contents and Uses.** Contact: Arnold Barnett Data Systems, 19 Orchard Way N.,

Rockville, Md. 20854.

Nov. 1-3, Chicago — **Integrated Office Technology Conference and Exposition.** Contact: Mary Beth Gouled, National Trade Productions, Inc., Suite 206, 9418 Annapolis Road, Lanham, Md. 20706.

Nov. 1-4, New York — **Vsam Structure and Programming.** Contact: Teltech Systems, Inc., 548 Fifth Ave., New York, N.Y. 10036.

Nov. 1-4, Regina, Sask.,

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Canada — **Project Management.** Contact: Brandon Systems Information, Montgomery Lane, Bethesda, Md. 20014.

Nov. 1-4, San Francisco — **CICS Application Design.** Contact: David Shapiro, Sales Representative, Sysed, One Park Ave., New York, N.Y. 10016.

Nov. 1-5, Philadelphia — **Systems Design Workshop.** Contact: Priscilla Goud-

reault, Education Coordinator, Q.E.D. Information Sciences, Inc., Q.E.D. Plaza, P.O. Box 181, 180 Linden St., Wellesley, Mass. 02181.

Nov. 1-5, Arlington, Texas — **Systems Analysis Workshop.** Contact: Priscilla Goudreault, Education Coordinator, Q.E.D. Information Sciences, Inc., Q.E.D. Plaza, P.O. Box 181, 180 Linden St., Wellesley, Mass. 02181.

Nov. 1-5, Washington, D.C.

— **Modern Data Communications.** Contact: George Washington University, School of Engineering and Applied Science, Washington, D.C. 20052.

Nov. 1-5, New York — **CICS/VS Macro-Level Applications Programming.** Contact: Rosa Roseto, Comped, 1133 Ave. of the Americas, New York, N.Y. 10036.

Nov. 1-5, Boston — **Fundamentals of Computer Systems Analysis and Design.** Contact: American Management Associations, 135 W. 50th St., New York, N.Y. 10020.

Nov. 1-5, Albany, N.Y. — **Recent Advances in CAD/CAM and Computer Graphics.** Contact: Mary Johnson, Manager of Corporate Relations, Center for Interactive Computer Graphics, Rensselaer Polytechnic Institute, Troy, N.Y. 12181.

Nov. 1-5, San Francisco — **CICS Command Level.** Contact: Analysts International Corp., Suite 811, 100 S. Ellsworth, San Mateo, Calif. 94401.

Nov. 1-5, Philadelphia — **Auditing in the Contemporary Computer Environment.** Contact: Marge Umor, EDP Auditors Foundation, 373 S. Schmale Road, Carol Stream, Ill. 60187.

Nov. 1-5, St. Louis — **CICS Macro-Level Application Programming.** Contact: Suzanne Carnahan, Washington University, Campus Box 1141, St. Louis, Mo. 63130.

Nov. 2, Washington, D.C. — **Unix Overview.** Contact: Computer Technology Group, Telemedia, Inc., 310 S. Michigan Ave., Chicago, Ill. 60604.

Nov. 2, Denver — **Writing User Manuals That Sell.** Contact: Sharon A. Stahlheber, Corporate Communications Associates, Suite 315, 799 Roosevelt Road, Building 6, Glen Ellyn, Ill. 60137.

Nov. 2-4, Providence, R.I. — **Broadband Network Seminar.** Contact: Marica Allen, Sytek, Inc., 1153 Bordeaux Drive, Sunnyvale, Calif. 94086.

Nov. 2-5, Hartford, Conn. — **Focus Query Language for DP Personnel.** Contact: Data Base Management, Inc., 281 Hartford Tnpk., Vernon, Conn. 06066.

Nov. 2-5, Hartford, Conn. — **MVS Diagnostic Techniques.** Contact: John Marotta, Amdahl Corp., One Corporate Center, Hartford, Conn. 06103.

Nov. 2-5, Boston — **Structured Programming: Techniques for Productivity.** Contact: Priscilla Goudreault, Education Coordinator, Q.E.D. Information Sciences, Inc., Q.E.D. Plaza, P.O. Box 181, 180 Linden St., Wellesley, Mass. 02181.

Nov. 3, New York — **CICS**
(Continued on Page 42)

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(Continued from Page 41)
Programming. Contact:
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Nov. 3-4, Washington, D.C.
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 Committee.** Contact: George
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Network Protocols. Contact:
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 91295, Suite 1016, 5959 W.
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EDITORIAL

Don't Breathe Too Easy

Stock prices continued to surge and interest rates to tumble last week as President Reagan confidently asserted that his economic policies are "beginning to succeed." While some business people might breathe a sigh of relief at this news, DP managers should temper any euphoria with realism. A recent *Computerworld* survey indicates that belt-tightening is still very much the norm throughout industry [CW, Oct. 11]. DP budgets are likely to hold the line during 1983, according to managers interviewed, and in some instances companies are targeting this traditionally high-growth area for staffing and hardware cuts.

Many managers acknowledged that their departments are already top-heavy as a result of past growth. Others compared level budget expectations for 1983 to rapid expansion in the past. For instance, a computer services director at a Houston instruments firm cited a 60% increase in staff in the past five years but expects no changes in 1983. And a vice-president of a small Missouri business said he expects the DP budget to hold flat in 1983 after jumping 50% in five years.

Expenses are being monitored particularly carefully in the area of hardware. Few managers indicated that their companies are planning major hardware upgrades in the foreseeable future, although many small and medium-size companies have made such upgrades in the two years since the recession took hold.

An increase in the use of third-party vendors for maintenance, software and leasing implies that businesses are reluctant to pay for the luxury of having these services supplied directly by the hardware vendor. However, some risk is involved. Third-party maintainers offer lower cost, but bank on the proposition that the equipment will not fail.

The handwriting is on the bottom line. DP departments must accept the fact that high growth rates are not likely to continue. Computer makers must come to grips with competition from third-party vendors vying for fewer DP dollars.

If recent economic developments stimulate business investment, it clearly will not be felt in the area of data processing for the coming year. This traditionally high-growth area of American business is experiencing a recession of its own.

DATA PAST

Five Years Ago Oct. 17, 1977

Itel Corp. reacted to the IBM 3032 and 3031 announcement with a card it had tucked up its sleeve.

The Itel AS/6 system, introduced within six hours of the IBM announcement, had been in the works for some time and was even accidentally advertised by the firm.

Itel promised first customer shipments in March, the same time deliveries of the IBM 3032 were slated to begin.

Wang Laboratories, Inc. introduced two large-scale minicomputers designed for business users with sophisticated processing needs.

Based on the 2200VS processor, the WCS/60 and WCS/80 systems offered virtual memory capability.

Ten Years Ago Oct. 18, 1972

NEW YORK — The value of computerized voter registration lists was being proven here as errors were corrected in tens of thousands of records.

A candidate for local election had charged that thousands of voters would become disfranchised, since they were notified they should go to improper polling places that would not have their names.

NEW ORLEANS — The Federal Bureau of Investigation regulation that law enforcement computers must be dedicated to this application is more a "power play" than a security consideration, computer experts and criminologists charged at an international crime symposium here.



LETTERS

Computing 'Myth'?

Larry DeBoever's In Depth article, "The Myth of User-Friendly Computing" [CW, Aug. 23], purports to discuss what he describes as the "myth" associated with user-friendly computing. According to my dictionary, a myth has "no foundation in fact," is "imaginary" and "fictitious."

Based upon my own observations, much of his article borders on mythology — at the very least, it is an extremely biased view of current information center trends.

DeBoever cites the learning curve associated with the mastery of the nonprocedural language. Most human learning is experiential. Yet the average person attending a two- or three-day course in one of the popular fourth-generation languages is able to utilize that tool from the very first day.

A person who has risen to a management position has probably spent more than half of his life in a classroom. Three days seems like a relatively insignificant amount of time to sacrifice to gain a skill that will increase one's decision-making ability.

Decisions can be made based upon timely information and obtained through the practical use of state-of-the-art tools. By comparison, it can be argued that the traditional data base management system is totally incomprehensible to anyone who has not majored in computer science or spent months (perhaps years) learning on the job.

I challenge the validity of the author's statement that "Some recent research suggests that nonprocedural languages are only marginally better than procedural languages for ease of learning and ease of debugging for simple queries."

Mathematica Products Group (MPG) provides Ramis II users with a complete set of debugging aids, error diagnostics and on-line help docu-

mentation.

MPG's Ramis II offers identical capabilities in all major IBM-compatible mainframe operating environments, including DOS/VS(E). The data bases are so independent of operating system facilities that they are even completely portable across all these environments, movable with a single, one-word command. I know of no other DBMS that can make this claim.

In my opinion, the issue of extracts vs. live data is only relevant if the source of information must be taken off-line and spooled to some flat or proprietary file to be read by the query generator or report writer. This limitation is avoided by the Ramis II language, which permits direct access to most major file-types and proprietary access methods.

As for the question "to type or not to type" — it appears that the keyboard remains the major stumbling block to end-user computing, according to DeBoever.

The trouble with myths is that they depend so much on imagination. Organizations that spend hundreds of thousands of dollars (not including staff costs) on "traditional" DBMS products learn all too soon the difference between fact and fancy.

Hence, the reasoning for the myriad of Ramis interfaces to these products.

Gerald J. Jurens
Mathematica Products Group
Princeton, N.J.

Computerworld welcomes comments from its readers. Preference will be given to typed, double-spaced letters of 150 words or less. Letters may be edited for purposes of brevity and clarity. Letters should be addressed to Editor, *Computerworld*, 375 Cochituate Road, P.O. Box 880, Framingham, Mass. 01701.

THE DATA CENTER / John P. Murray†

Who Should Have Control of the DBMS?

The responsibility for the control of the technical aspects of the data base management system (DBMS) should not be placed with the data center or technical support sections of the management information systems (MIS) department. The responsibility should be the province of the data base group.

I am convinced that more real data base progress can be accomplished with the DBMS in the typical installation if the DBMS group has complete control. I am willing to agree that progress is being made in those installations where the control resides in the data center, but more can be accomplished if it is not.

This view is not in any way intended to denigrate the value or function of either the technical support people or the work they perform. In fact, too often the technical support people receive little or no credit for their work.

Little Appreciation

Unfortunately, there is little appreciation outside the data center for the issues faced or the demands made on the technical support staff. When the system is running well, everyone ignores technical support. When it

fails, pressure on technical support to get the system operational is both intense and immediate.

Once the system is operational, no one ever thinks to say "thank you" to the technical support people. The prevailing attitude is usually "that's your job."

Good technical support people are critical to a solid MIS function. Anyone who has spent any time in an installation with a poor technical support group can readily appreciate the value of good technical support people.

If technical support is so necessary, why shouldn't the technical responsibility for the DBMS be placed with them? The reason has to do with the "cultural" aspects of both the technical support group and the DBMS effort.

The goal of the DBMS should be to increase flexibility, productivity and access to and manipulation of data. Achieving that goal requires increased hardware resource availability and orientation directed more toward results and less toward technology.

Through the years, technical support has had as one of its primary responsibilities a requirement to make

sure the hardware resource is used as effectively as possible.

Because the ultimate success of the DBMS effort depends to some extent on a sacrifice of hardware efficiency in order to provide good service, a technical support dilemma exists. Rigid hardware constraints will work against the DBMS effort.

Almost any discussion of a DBMS at which technical support people are present is almost certain to elicit a statement from them that the DBMS requires "too many" resources. "Too many" is relative. The DBMS does require increased hardware resources. The benefits derived from the installation of the DBMS must outweigh the additional hardware requirements or the DBMS should not be installed. If, in the judgment of the organization's senior management the installation of the DBMS is justified, then whatever resource availability is required should be accommodated.

A continuing battle between the DBMS group and the technical support group over the amount of resources to be devoted to the DBMS is counterproductive.

Many installations face problems today in providing adequate resources in terms of CRT response

times and batch production turns to their clients, including systems and programming. That means, at least in the case of systems and programming, that talented, productive people find themselves bored and frustrated. This is one of the reasons these people finally choose to leave an installation.

Whose Fault?

This lack of adequate resources may or may not be the fault of technical support. It may be the result of the way in which the system is configured, or it may be that MIS management has not been able to secure sufficient funds to provide adequate hardware. Such a situation cannot be tolerated in a DBMS environment if it is to achieve its full potential.

When the DBMS is installed and the clients see the advantages of the system, adequate resources must be available to handle the demand. Usually, because of the improvements offered via the DBMS, that demand will grow rapidly. Impeding the DBMS progress because of a desire to "fine tune" the system will at best slow the DBMS effort and at worst doom the effort.

I realize this subject is fraught with political considerations. The subject is not one that is welcomed in many MIS installations. If it is raised, technical support usually prevails.

The possibility that the total responsibility and authority for the DBMS should be placed with the DBMS group should not be ignored.

Murray is director of MIS for Ray-O-Vac Corp., Madison, Wis. He is responsible for worldwide MIS activities. Murray has 20 years of DP experience, 10 of which have been devoted to the management of data centers.

HUMAN CONNECTION / Jack Stone†

Response From a 'Wunderkind' Reader

It is always a joy to receive letters from the readers, the more so when their writings attempt to rend asunder my theories about the grand people that make up the data processing industry, and then I can turn around and shred their logic chain into smithereens.

Take, for example, a response to my latest series, "Trials of a Terminal Operator," written by one Aaron Epner, a preteenage DPer who performed an in-depth analysis on the first article in the series, "Is Everything 'A-OK' With Your Terminal Operators?" [CW, Aug. 30].

In his letter, he took sharp issue with my views relating to female-oriented senior citizens who are miscast in the mold of data processing super-techs, specifically my disbelief that, quoting from the article, "If I were to organize a hot-shot operations team of 100 grandmas in the D.C. Stadium Starplex, each with a personal CRT and a 'do-it-by-the-numbers' computer guide on her lap, the vast majority would be capable of threading their ways through the hierarchical command chains and successfully executing an application program — without assistance."

So, here is this critic's epistle, presented sentence-by-sentence, with my in-depth refutation:

Epner: My dad read me your article on a grandma using a terminal.

Stone: If this child spent less time in video-game casinos and more time hitting the books, he probably would have the capability of reading on his own by now and received an entirely different perspective on my handling of the issues presented in the

article.

Epner: I find that my grandma does just fine on my machine, as long as I give her a little help now and then and if I don't use too many words that are strange to her, although sometimes she isn't sure if I'm not making some of them up.

Stone: See? See? Another classic case of a data processing professional overwhelming a user with obscure verbiage in an attempt to achieve intellectual superiority. I'll bet that the grandma could see right through his transparent thrust toward one-upmanship and parry with a term of endearment that would keep this wild-eyed DPer under control.

Epner: It took me half-an-hour to convince her the television was really a CRT.

Stone: He probably shot much of the time explaining the electronic intricacies of the driver circuits.

Epner: Now I may be only nine years old, but it seems that computers aren't that hard to use.

Stone: Quiet, kid. I make a living by training end users.

Epner: And my grandmas are smart. It's just that they need some TLC — that's tender loving care, not terminal locator code.

Stone: He's beginning to see the light for training effectiveness: Be nice to your user/student and ye shall receive a half-a-buck for a piece of bubble gum.

Epner: You see, it's not easy for grandmas because they didn't have video games when they were kids.

Stone: And, therefore, are all the better off for it.

Epner: So don't knock grandmas.

Just give them a fair chance. Your friend, Aaron Epner.

Stone: Come to think of it, there is a critical shortage of data processing people who have the gift of empathy. I wonder if this wunderkind might have a valid approach . . . ?

READER COMMENTARY / Walter Murphy†

An Impersonal Computer

In the man/machine relationship, man is a masochist. With this in mind, I have developed a prototypical computer for what I believe is an important market. May I present the NYC III Impersonal Computer.

The NYC III was designed to provide a sense of foreboding as the ideal learning environment. Unsolvable bugs have been designed as system features. Following are some salient traits of the system:

Slow processing time. An attractive feature for home use. While rudimentary sorts and compiles are performed, the user is freed for more important tasks. With typical response time, a user could shingle a garage, cook a formal dinner for 12, learn French or pen a 10,000-nasty-word letter to the vendor.

Cumbersome design. The NYC III doesn't fit on a desk, the paint will peel and metal will rust upon warranty expiration.

No programmability. This feature will save countless hours of frustration.

Gruff prompting messages. Written to hinder, all messages assume that the user is as intelligent or experienced

as the designer (which is hardly likely). Prompts include: "Wrong!", "You've got to be kidding," and "I'll be right back; I need a breath of brains."

Reluctant operating system. Impossible to diagnose, the operating system will not let you do anything you really want. All purchased, supposedly compatible software will self-destruct upon implementation.

Awesome keyboard. Since over 200 keys are jammed into the standard size keyboard, the user must type with pencils taped to his fingers.

No documentation. This feature is ideal for the first-time user, because it encourages him to develop problem-solving methods.

I realize that marketing the NYC III on a national level would tax mine and the nation's patience. Therefore, I plan to limit the initial campaign to the greater New York City area, where users resemble characters from a Woody Allen movie: neurotic, emotionally downtrodden and technologically paranoid.

Murphy is a consultant specializing in the technical writing field.

Title of Computer Degree

I applaud the article "Getting a DP Job: Choosing the Road" [CW, Sept. 20], Part 3 of *Computerworld's* series on vocational schools. The message the writer was attempting to deliver cannot be said often enough or in enough different ways.

I do believe that one key point was overlooked and that is: What is the title of the computer degree? The title of the degree program may give a perspective student some insight into the underlying nature and intent of the degree program.

Based upon the efforts of the Data Processing Management Association Model Curriculum Executive Committee, three distinct career paths were identified as being viable and necessary in computer-related fields. Quite different degree programs have or are evolving to prepare grad-

uates for entry into each of these computer career paths.

Although called by different names at different colleges and universities, the most commonly used names appear to be computer engineering (for the hardware design group), computer science (for the systems software group) and computer information systems (for the business applications development group).

Students should be aware that not all colleges provide a choice of computer degrees. When that is the case, they must also determine what flavor the offered degree is regardless of name.

Once again, thanks for providing a valuable message to people that

might be considering entering the data processing field.

Gerald E. Wagner
President

The Society of Data Educators
California State
Polytechnic University
Pomona, Calif.

Vocational Ed. vs. College

I greatly enjoyed *Computerworld's* three-part series on vocational schools. I would agree that the university system suffers from several major problems that have to be dealt with before it can effectively provide DP training on a level with the private vocational schools. This is not a

recent problem. George Nolfi of University Consultants in Cambridge, Mass., published a federally financed study 10 years ago that demonstrated private vocational achievement and cost-efficiency for students in vocational schools over public college systems. As the series pointed out, a major problem is the colleges' inability to offer competitive salaries; however, other major problems also exist.

Except in those few colleges wealthy enough to pursue research in data processing, teachers "condemned" to academia find that their skills are getting progressively more obsolete. DP technology moves so rapidly that unless one is an active practitioner in the field, it is difficult to stay with current technology.

A corollary of this problem, but also directly related to the structural intricacies of college administration, is the amount of time it takes to get a new curriculum implemented. In most cases, from the time of identification of need to introduction to the classroom, one to five years will be required. It is obvious that such a slow response time will severely impact a college's ability to provide quality training in time.

Additionally, it is a common administrative practice to reap the most with the least investment because of the dire straits of four-year colleges in general. Terminal time for students at a number of Boston-area colleges is so scarce that it is common to see students lined up in the middle of the night waiting for their turn on the computer.

Private vocational schools, in my opinion, are in a much better position to provide quality training in this area for several reasons. They must be responsive to changing technology and industry needs because they depend directly on successful placement of graduates for stability and growth as a business.

At the Center for Computer Education (CCE), we pay highly competitive market rates for programmer/instructors with nine years or more of experience. In return, we expect our instructors to teach one to two years to share their current knowledge. After this period, they need to return to direct participation in industry to update their knowledge and skills. This is the "hard" nature of the DP industry. The intensive quality of their role as instructors prohibits anything but a "keep-in-touch" reality while teaching.

This cycle is in direct conflict with the tenure system of most colleges, but it keeps CCE and its teachers current — at the forefront of change.

In reference to the quality of teachers, I do take exception to the statement that "big-name data processing schools . . . can afford to lure qualified teachers" while smaller ones, such as Aircor, Inc.'s Computer Learning Center (CLC) cannot ("Lack of Good Teachers Marring DP Education," CW, Sept. 13).

CLC is very large, not small. Aircor is a \$2 billion dollar/year company, second only to Control Data Corp. in this field (to my knowledge). I could be wrong, but Control Data Institute has approximately 13 schools and CLC has 10 schools, which definitely makes them major operations.

Daniel M. Barraford III
President

The Center for Computer Education
West Newton, Mass.

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engineered to yield the most impressive reliability figures we've ever seen. But CompuStar users are not only thrilled with our system's performance (and the miserly few dollars they spent to get it), they also have the peace of mind of knowing that Intertec's comprehensive customer protection and field service programs will insure their total after-the-sale satisfaction.

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Graduate Disagrees

This letter is in response to James Godsey's letter to the editor [CW, Sept. 20].

As a recent graduate of Corpus Christi State University (CCSU), I would like to take issue with Godsey's accusations. I graduated with a B.S. in computer science and a minor in business administration. CCSU has a very good program in computer science, and a student can minor in just about any subject he wants to, including business.

The reason that the university doesn't cover business topics directly in computer classes is because the College of Business offers all of those concepts in its courses. Management, accounting, finance, economics and general business classes are included. If a student really wants to get some instruction on how a business

works instead of the internals of a computer, there are plenty of courses to take.

As for Godsey's accusation that what they teach at CCSU is not used in the real world, this could not be further from the truth. Every program that I wrote in my classes could have some application in the business environment. Most of the classes are kept up-to-date by the instructors — who are constantly communicating with professionals in businesses.

Some of the instructors do consulting work for businesses on a regular basis, and most make a strong effort to stay current in the field, both from an academic and practical stand-

point.

If CCSU did not have a good program for teaching students business programming, why would big corporations regularly come to this college to recruit computer science graduates?

Paul C. Luse

Corpus Christi, Texas

Speaks From Experience

James Godsey's letter to the editor [CW, Sept. 20] undermines the quality of data processing education at Corpus Christi State University. Perhaps a more enlightened critique is in order.

We are primarily responsible for

the business systems recruiting effort for the Computer Services Department of Brown and Root, Inc. in Houston. Until the recent recession, we were hiring approximately 65 business systems graduates a year.

As a result of working with numerous graduates over the years, we and our managers are very pleased with the quality of the data processing curricula at universities such as Southwest Texas State, Texas A&M, University of Texas at San Antonio, Texas A&I University, the University of Houston and Corpus Christi State University.

Our experience indicates that graduates of those schools are well prepared to work in all areas of data processing and make practical application of their education.

Dr. C. Beau Bobbitt

Manager, Personnel Administration and Development
Richard L. Quinn
Manager, Finance and Administration

Computer Services Department
Brown & Root, Inc.
Houston, Texas

Comments on Coding

Jack Stone's article, "Simple Code Pays Off" [CW, Aug. 2], reflects more than 20 years of DP industry misconception.

I feel confident of being correct when I say that the installation to which Stone refers has similar Cobol coding as all others. This conclusion stems from his article, which takes the same approach as others before him.

To quote the article, "Comments should be used, but not excessively, as they can be distracting." Impossible!

What can be distracting are meaningless comments, whether they be one line or more.

Meaningful comments are never distracting. Quoting the article again, "They should, of course, describe the program's purpose and be used for areas of unusual code." Comments should be used not to describe the purpose, but to describe the methodology used by the individual programmer to implement the purpose.

It is the methodology that is not clear to the maintenance programmer. This is an exceedingly important distinction that has eluded our industry.

Meaningful comments, data names and paragraph names are the key to easily understandable Cobol coding. All the rest have little meaning by comparison. To lump them together in an article is to show clearly that the writer has not recognized the basic problem.

Last but not least, to say: "As a concluding note, we don't feel it's desirable to expend the resources to control code much beyond these guidelines" is another statement reflecting the nonrecognition of how much excessive program maintenance costs are hurting our industry.

I know this statement really stems from the writer's past experience subconsciously telling him his approach to reducing program maintenance costs will fail as all others preceding him.

Jerry Sitner

Sitnerology
New York, N.Y.

LETTERS



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CW 10182

The Benchmark in World Class Computers

Large IBM Systems Get Relational DBMS

VANCOUVER, B.C. — Sydney Development Corp. has launched a relational data base management system, Conquest, for large IBM and plug-compatible systems.

Conquest will reportedly provide the data base management software component for a planned family of decision support products to be marketed by the vendor under the name Conquer. Conquest boasts an English-like language, allowing use by management with no computer background, the vendor claimed. The system also features optional graphics, the vendor said.

This product boasts the ability to provide access to stored data simultaneously for a number of users and to feed in company facts and figures, the vendor said. With a single command, users can find specific information, produce a color graph and call up explanations and assistance for display by pressing a single help button.

The Conquest system comes with three levels of security: restriction on who can access Conquest, control of access to data managed in the system and encryption of data before storage.

When a table or file is being defined, users may specify that any data added has to be encrypted before it can be stored, the vendor explained. The user supplies an encryption key when the table is defined and must supply this correctly each time he wishes to use that data.

Conquest can be used on IBM's 4300, 30 and 370 series computers and plug-compatibles. It can run under VM/CMS or MVS/TSO operating systems. Additional hardware is required to support its graphics options.

Licensing for Conquest is set at \$17,000, and the optional graphics package is \$3,000, the vendor said from 600-1385 W. Eighth Ave., Vancouver, B.C. V6H 3V9.

Commercial Compiler Translates APL Code Into IBM 370 Language

ROCKVILLE, Md. — STSC, Inc. has announced the development of what it claims is the first commercial compiler for the APL programming language. The company claimed the compiler will provide performance improvements in user functions and application execution time for APL users.

The compiler, which will translate APL source code into IBM 370 machine language, will be available next spring, according to the vendor. The initial release will be available on STSC's APL*Plus time-sharing service for compiling selected portions of STSC applications.

As development proceeds, STSC plans to provide compiled code to its software product customers.

STSC anticipates that the APL compiler will expand the use of APL to a wider range of appli-

cations. Until now, the company admitted, APL has required costly, complex and time-consuming manual code optimization.

Al Bahar, vice-president of systems development at STSC, said the compiler will have no direct impact on the language, but will make certain functions more efficient. "People will not avoid [those functions] any more. The indirect effect will be to expand people's usage of the full array of APL's capabilities."

"Not every aspect of the program will be sped up by the compiler," Bahar continued. However, the product will "improve the performance of the most resource-consuming parts of the language."

Michael Crick, an independent APL consultant based in Seattle, observed that one of APL users' major complaints has been that "it hasn't been fast enough." He suggested that the compiler "will rectify this."

Costs for the APL compiler on STSC's time-sharing system will be based on volume and usage. STSC is based at 2115 E. Jefferson St., Rockville, Md. 20852.

Unveiled at Irus Conference Graphics, Interface Out for RSTS

BOSTON — Two software packages — a graphics system and an interface to Britton-Lee, Inc.'s relational data base management system machine — were among the products unveiled at the Independent Research-Sharing Time-Sharing System (RSTS) Users Society (Irus) meeting held here recently.

Data Processing Design, Inc. (DPD) went to the Irus meeting to announce IB Graph, which is compatible with its Word-11 word processing package, according to Eric Moothart, software marketing director for DPD. IB Graph is a multiuser interactive business graphics system running in a time-shar-

ing environment under DEC's RSTS/E, CTS-500 and VAX/VMS operating systems.

IBM Graph features pie chart, line chart and bar graph functions. (Continued on Page 50)

Tell Us About Your Applications Packages

When the word comes down that a new application is required and — as always — it's needed "yesterday," the solution is often a software package.

In the Feb. 28 issue of *Computerworld*, a Special Report on Applications Software Packages will focus particularly on what happens after a package comes in-house.

We want your input for this

Special Report in the form of stories that describe your experiences with specific products, as well as tutorials that examine particular topic areas regarding applications packages but are not product-specific.

Stories and tutorials should be five to 10 pages typed, double-spaced. The deadline for submissions is Jan. 7. Black-and-white photo-

graphs and other graphics (camera-ready art if possible) are welcome.

Further information on this Special Report and a one-page listing of possible topic areas can be obtained from Staff Writer Susan Blakeney. Manuscripts should be sent to her at *Computerworld*, January Special Report, P.O. Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

New Bug-Killer for COBOL Programs.

CA-OPTIMIZER is now available to DOS/VSE users through Computer Associates to improve COBOL program performance.

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The ANALYZER reports of CA-OPTIMIZER provide programmers with a fast, reliable way to thoroughly debug, test, tune and maintain their COBOL source programs.

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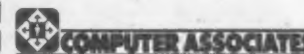
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CW 10/18/82

Seven Features Out for Mics MVS Integrated Control Enhanced

VIENNA, Va. — Morino Associates, Inc. has announced seven enhancements to its MVS Integrated Control System (Mics) software for IBM MVS installations.

Release 4 of Mics features:

- The Mics Component Generator Facility, which reportedly permits the user to define his component through a definition language which, when processed, produces the SAS Institute, Inc. SAS code supporting all of the Mics data base facilities.
- The Mics Data Base File Tailoring Facility, which allows users to meet their installations' specific require-

ments by defining the Mics files to suit their needs.

- The Mics Structured Analysis Facility, which has been extended to use IBM's Dialog Manager as its panel manager and allows the user to access all the Structured Programming Facility (SPF) functions as options on the SPF primary menu.
- The SMF Component Operations Information Area, which provides information on IPL statistics, change status, operation incident and system configuration.

• The Mics Documentation Features now include the System Modification Guide, which describes the structure of Mics and explains how

to use the Mics User Component Generator.

- The RMF Component System Control Program Area, which has been extended to support the RMF Monitor Activity Record.
- The Best/1 Model Generator Compendium, which now exploits the detailed I/O modeling features provided by Best/1 Release 7 from BGS Systems, Inc. and addresses requirements and suggestions provided by current users.

The license fee for the initial year of Mics is \$26,450. Further details are available from Morino Associates at Suite 602, 8133 Leesburg Pike, Vienna, Va. 22180.

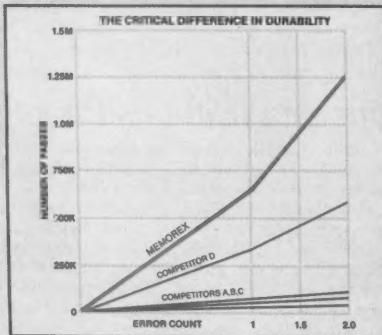
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CICS/MVS Users Offered 'Dads' Allocation Tool

ROCKY HILL, Conn. — Software Technologies and Research, Inc. (Star), a newly formed software company, has introduced its first product, a tool for IBM CICS/MVS users.

Dynamic Allocation/Deallocation Subsystem (Dads) enables users to allocate or deallocate data sets interactively and during CICS initialization processing, according to the vendor. The Dads control file is created and maintained by the systems support group and reportedly eliminates the need for the file data dictionary statements in the CICS start-up JCL.

During initialization, Dads will detect and provide notification of any errors during open and allocate processing, while allowing the initialization of CICS to continue. Automatic verification will also be done on any Vsam file not in a closed status, the vendor explained.

Dads costs \$10,500, and Star is based at 41 New Britain Ave., Rocky Hill, Conn. 06067.

Packages Out For RSTS

(Continued from Page 49)

tions including stack line, interweaving lines and horizontal bars in a range of up to eight colors.

The system reportedly offers a user-friendly format driven by more than 35 menus. Nearly 700 "help" screens are incorporated "in an effort to put a major portion of our documentation on-line," according to Moothart.

Moothart said IB Graph can be bundled with user data files or Word-11 or Decword WP systems to create graphs automatically without user handling. Users can also build a portfolio of predefined chart specifications and integrate data automatically, he added.

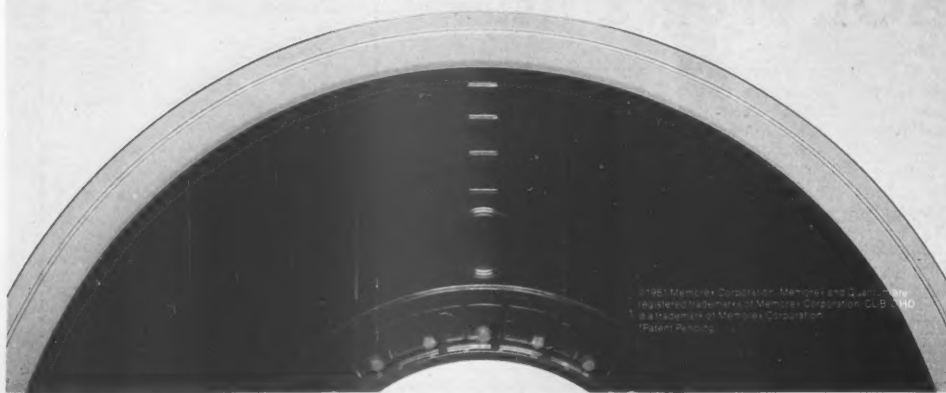
IB Graph is currently in field test and will be available in the first quarter of 1983. Moothart said its cost to a PDP-11/70 user will be about \$7,500, with lower prices for users of smaller PDP-11 systems. The company is located at Suite F, 181 W. Orangethorpe, Placentia, Calif. 92670.

Evans Griffiths & Hart, Inc. (EG&H) announced software said to provide RSTS users with an interface to the Britton Lee, Inc. IDM System 300/600 relational data base management system. The software will be available by late next spring, according to Thomas Evans, president of the company.

The IDM system uses a dedicated special-purpose processor located between the host computer or computers and disk storage modules in order to handle data base management in a location separate from the host computer.

The EG&H software will allow RSTS users to communicate with IDM through a query language and to access the data base machine from application programs.

Evans explained that a price for the RSTS software interface is not yet available. The company is located at 55 Waltham St., Lexington, Mass. 02173.



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SSSD = Single Sided Single Density; SSDD = Single Sided Double Density; DSDD = Double Sided Double Density; SSQD = Single Sided Quad Density; DSQD = Double Sided Quad Density; TPI = Tracks per inch.

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Mark XI 200 MB. Error Free	03-35041	720.00
Flag Free	03-35031-02	560.00
DEC Flag Free	03-35031-03	560.00
Mark XII 200 MB. NCR/CDC Flag Free	03-39001-01	515.00
Honeywell Flag Free	03-39000-01	515.00
Mark XIII 300 MB. Error Free	03-47021	795.00
Flag Free	03-47009	670.00
Mark XIV 80 MB. Unformatted Error Free	74-16600-03	365.00
Flag Free	74-26600-03	300.00
Honeywell Format Flag Free	74-26600-08	315.00
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VMBACKUP Highlights:

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VMTAPE will:

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CA-Scheduler Enhancement, CA-Jasper Out for VS1, MVS

JERICHO, N.Y. — In a series of recent announcements, Capex Corp. introduced Release 6.0 of its CA-Scheduler system for automated scheduling and operations management and added the CA-Jasper family of performance management and job accounting tools to its Operations Management Software (OMS). Both announcements apply to IBM and plug-compatible VS1 and MVS installations.

Version 6.0 of CA-Scheduler report-

'Docu/Text-200' Gets Graphics With Release 3.0

SAN JOSE, Calif. — Graphics capabilities of laser printer flowcharts have been added to Diversified Software Systems, Inc.'s Docu/Text-200 with Release 3.0.

The software, which runs on IBM and plug-compatible mainframes, reportedly takes advantage of the graphics capabilities of the IBM 3800 and Xerox Corp. 9700 laser printers. Also new to the system is a Pansophic Systems, Inc. Panvalet/Applied Data Research, Inc. Librarian interface for on-line forms and compatibility with Panvalet and Librarian files for the Select facility.

Pricing for Docu/Text-200 ranges from \$14,500 to \$28,500, depending on options. Further details can be obtained from the vendor at Suite 205, 996 Minnesota Ave., San Jose, Calif. 95136.

WSU Generator Fits System/34

LITTLE ROCK, Ark. — Arkansas Systems, Inc. has developed a Work Station Utility (WSU) Program Generator to run on the IBM System/34 computer.

The software is said to generate a WSU program from the user's specifications that allows entry or update of any file. Reportedly easier to use and more flexible than IBM's Data File Utility, the package does not require the entering of information about each field because that data is already specified in another source member.

The record reportedly can be built up to 4,096 characters in length. There can be up to 600 fields in the record. The WSU Generator costs \$345 from the vendor at Suite 202, 8901 Kanis Road, Little Rock, Ark. 72205.



'We Use Some Pretty Sophisticated Data Handling Methods Here.'

edly allows for extended processing capabilities. New features include CA-TLMS II and University Computing Co.'s UCC-I interfaces under TSO and Roscoe interface, which provides on-line access to CA-Scheduler. The option to use the CA-Jobdoc data base as CA-Scheduler's JCL master file has also been included in this release. This product costs \$37,800 for a three-year license.

CA-Jasper consists of four subsystems: CA-Jasper/JA, CA-Jasper/CICS, CA-Jasper/IMS and CA-Jasper/XMF. They analyze and monitor production, measure system utilization and performance and identify areas of possible improvement. They also provide costing and billing functions for all user areas, according to the vendor. This family of products costs \$40,680 for a three-year license. Capex is located at 125 Jericho Tpk., Jericho, N.Y. 11753.

Legal Aid Bows For System/34

PORT CHESTER, N.Y. — IBM has announced a legal information and financial management package for law firms using the firm's System/34 processor.

Called the IBM System/34 Information system, the package was developed by Manac Systems International, Ltd. in Montreal. The package consists of 14 application programs that are divided into three major categories: Financial Management, Administration/Support I and Legal Practice I, IBM said.

The package was designed to operate on a System/34 with a minimum configuration of a 5340 processing unit with 27.1M bytes of storage, a line or matrix printer and a 5251 display station, according to IBM.

The cost of the package varies depending on modules selected. Modules cost from between \$250 and \$14,000, IBM said.

Checkbook Out for IBM Unit

MAITLAND, Fla. — An automated checkbook for users of the IBM Displaywriter has been announced by Scope Software Products here. The Cash Management System reportedly incorporates all necessary shell documents, stored file setups and file descriptions.

The system runs completely on Reportpack, an IBM-supplied feature of the Displaywriter, without need for other languages or operating systems, a spokesman for the company reported.

Management reports in the system include an automated checkbook, a printout by account name for accounting summaries, a printout by payee for vendor analysis and a printout of deposits by account number for revenue reporting, according to the vendor.

The system costs \$65. The firm can be reached through P.O. Box 1674, Maitland, Fla. 32751.

For System 2000 Monitor Device Out for Intel DBMS

ELGIN, Ill. — A performance monitoring and tuning aid for users of Intel Corp.'s System 2000 data base

management system has been introduced here by Garman Consultants, Inc.

Software Development Package Enhanced for IBM's IMS DBMS

WAITSFIELD, Vt. — CPI has announced Release 1.1.0 of its IP3 software development package for use with IBM's IMS data base management system.

IP3, the IMS Programmer Productivity Processor, has been enhanced to include Boolean algebra, additional checking features at precompile time and more data base administrator summary reporting features. It also supports Pansophic Systems, Inc.'s Panvalet and Applied Data Research, Inc.'s Librarian software and includes better variable length segment support, according to the ven-

dor.

IP3 reportedly replaces non-Cobol data base statements with nine non-procedural verbs that fully conform to Cobol syntax and installs in minutes. It is MVS release independent and is base-priced at \$44,000, or \$18,000/mo, the vendor said from Larrow House, Waitsfield, Vt. 05673.

DB-Analyze provides users with a detailed analysis of their System 2000 data bases, according to the vendor. It reportedly produces a complete analysis of all indexes, File 2 and File 4 and detailed reports on the schema records in File 5 and File 6.

DB-Analyze also provides the average length of each sibling chain and tells whether records for an entry are physically contiguous or if they are scattered throughout the data base.

The monitoring and tuning aid costs \$5,000.

Further details on DB-Analyze can be obtained from Garman Consultants at 143 Brookside Drive, Elgin, Ill. 60120.

Software Link Ties 'SAS,' 'Simplan'

CHAPEL HILL, N.C. — Simplan Systems, Inc. has released an interactive software linkage between SAS Institute's SAS (Statistical Analysis System) and its own corporate planning software called Simplan.

Saslink runs on IBM mainframes and plug compatibles. It reportedly provides for the interactive transfer of data between SAS and Simplan, enabling the corporate planner or financial analyst to utilize the full spectrum of SAS procedures.

This product costs \$5,000 from the vendor, located at 300 E. Town Drive, Chapel Hill, N.C. 27514.

Performance Aid Fits IBM Series/1

SAN FRANCISCO — A performance tool has been introduced here by H&A Computer Systems, Inc. for the IBM Series/1.

Series/1 Performance Analyzer can reportedly be used with all versions of the IBM EDX operating systems and allows users to measure activity in two ways. The first way is its ability to analyze a single EDX program in iterations to find out which source statements are using computer resources.

The other use of the analyzer enables total system measurement for use when several programs are competing for system and I/O resources, according to the vendor.

This product licenses for \$3,500, from H&A, Suite 204, 30 Hotaling Place, San Francisco, Calif. 94111.

System/34 Gets Free Programs

LAS CRUCES, N.M. — Six documentation programs for the IBM System/34 are available free from Burn Construction Co., Inc.

The trade library of software includes the following: job accounting using the history file, diskette usage and inventory control, on-line file specifications maintenance, on-line runbook maintenance, report writer and a procedure listing and cross-reference package.

While the software is free, "I would hope that, if anyone requesting the programs has anything of a similar nature that he thinks I might be able to use, he would return the favor," DP manager Jerry Adams indicated.

Those wishing to obtain the software should send a double-density diskette and a prepaid return postage envelope large enough for the diskette and eight 8½-in. by 11-in. sheets of documentation to Jerry C. Adams, DP Manager, Burn Construction Co., P.O. Box 1869, Las Cruces, N.M. 88004.

McCormack & Dodge can afford any 3270 compatible terminal. Why would they choose the least expensive? Control Concepts.



1. "Regardless of the cost, we have to know our 3270 terminals are going to run every time we plug them in. Because that's how we demonstrate our on-line financial software programs to potential clients. And that's why we prefer to use a Control Concepts terminal. It goes directly to the demonstration site with us, usually in the trunk of a car. We know it will perform."

2. "The integrated modems allow us to get our terminals on-line instantly. That's especially critical to us since our business is selling advanced financial software to discerning clients. Plus, when we need a new terminal from Control Concepts, we know we'll have it within 72 hours."

3. "At Control Concepts, they build their terminals tough, and then they thoroughly test each one before it ever leaves the factory. On those rare occasions when service is required, we know we can count on Control Concepts to get us back on line immediately. Usually, the problem can be resolved over the telephone."

4. "Reliability. Fast Delivery. Service. We get it all in a Control Concepts 3270 terminal. And best of all, we get it for less money than we'd have to pay for any comparable terminal on the market."

— Bill Holland, Communications Manager McCormack & Dodge

Whether your 3270 compatible requirements are in the office or in the field there are many more reasons to choose a Control Concepts terminal. Get your own inside story today by calling 800/368-3078 (in Virginia 703/631-0435, in California 714/235-6721). One of our Applications Engineers will explain how easy it is to fit a Control Concepts terminal into your business.

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The new Map-Manager program by Deva Systems Software, Inc. will greatly increase your CICS mapwriting productivity. MAPMAN is an on-line aid that allows CICS programmers to design and format screens interactively. The program automatically produces the BMS macros necessary to define the screen for CICS. This means that even inexperienced programmers can generate new maps almost immediately. What's more, MAPMAN allows programmers to easily modify existing CICS maps interactively, and regenerate a new map; all without the extensive coding effort usually required.

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Because Deva makes it a policy to produce products which require no modifications to IBM or user software, MAPMAN is ready when you are. Since both the construction of, and maintenance to, all maps is performed in an interactive, menu-driven mode, functional maps can be maintained with minimal effort. Further, immediate hard-copy output of any map is available as a documentation aid.

Satisfaction guaranteed.

It's simple: MAPMAN is guaranteed to perform. This guarantee is backed by a policy of free maintenance, and distribution of any enhancements made, for a period of one year. Deva also offers its clients direct contact with the authors of its software should the need arise.

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For information on how MAPMAN can help alleviate your productivity problems and enhance CICS map design capabilities, complete and mail this form. To order MAPMAN, call toll-free, 1-800-531-1002. In Texas, call collect, (512) 736-4261.

MAPMAN, Map-Manager software by Deva Systems Software, Inc. Price: \$3,000

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DEVA

DEVA SYSTEMS SOFTWARE, INC.

4414 Centerview Dr., Suite 220, San Antonio, Texas 78228, 1-800-531-1002.

Generator Produces CICS Maps

FAIR GROVE, Mo. — A CICS map generator that reportedly allows programmers to develop and document CICS maps 10 to 20 times faster than IBM's Basic Mapping Support system has been announced by MacKinney Systems.

Called CICSMAPR, the package reportedly requires less than 15 seconds for a processing run even when several maps are involved. The company said the package allows users to enter images on a CRT terminal with Xs or 9s in the input fields and literals in the fields with an initial value.

Attribute bytes are generated based on the contents of the field or may be specified by preceding the field with a special character. CICSMAPR generates an Askip field immediately after each input field to prevent accidental keying beyond the field's end.

The package is available in Cobol source code for \$395 or \$99/year. MacKinney Systems can be reached at Box 270A, Rt. 2, Fair Grove, Mo. 65648.

Banking Package Aids Checking

TOWSON, Md. — Viable Information Processing Systems, Inc. has introduced a utility check-processing software package designed to allow banks to process their checks on another bank's check-processing equipment under emergency conditions. It runs under the IBM operating systems DOS/VS, DOS/VSE, OS/VS1 and MVS.

The package allows movement of the check-processing function to a variety of operating environments without the need for modification or recompilation. A variety of output options are included. It can also be used as a utility check capture system, a vendor spokesman said.

The package is available for \$25,000 from Viable Information Processing Systems, Suite 408, 40 W. Chesapeake Ave., Towson, Md. 21204.

Trucking Firms Get Transport System

SIoux FALLS, S.D. — SD Transport Services, Inc. has announced the completion of its Electronic Transportation Data Processing System for the motor carrier industry, designed for both owner-operators and company drivers.

Modules may be purchased individually for the system, written in RPG-II for IBM's System/34. Revisions are currently in progress to convert the system to Basic for IBM's System/23.

The system includes modules for accounts receivable, accounts payable, payroll, general ledger and financial statements, billing or rating, owner-operator settlement and deduction, fuel-tax reporting and vehicle licensing, the company said.

The Electronic Transportation Data Processing System is priced at \$20,000 for a complete package including financial and fuel reporting from SD Transport Services, P.O. Box 480, Sioux Falls, S.D. 57101.

'Magec' Update Generates Menus

CARROLLTON, Texas — Ala, Inc. has added automatic menu generation from dictionary in Release 1.1 of its Magec on-line application development system.

Magec supports CICS and Applied Data Research, Inc.'s Datacom DC (data communications) with Vsam or Datacom DB (data base).

Magec's menus are produced from its security tables on demand without any coding. Also included in Release 1.1 is enhanced automatic screen field editing, improved interactive screen format mask definition facilities and improved message compression, which is said to be transparent to the applications.

Magec is priced at \$18,600. Ala is located at 1029 Oxfordshire, Carrollton, Texas 75006.

Assembler Out For 8-Bit CPUs

LA JOLLA, Calif. — A cross assembler that produces object code for any 8-bit CPU has been announced by Primarily Software, Inc.

Called Cross80, the assembler reportedly runs on all Prime Computer, Inc. 50 series systems, as well as the Prime 400 and 500. The assembler has a macro facility that allows users to modify the assembler's Zilog, Inc. Z80 instruction set or to define the instruction set of a different 8-bit processor.

Macro libraries are provided with Cross80 to accommodate Intel Corp.'s 8080, 8085, 8048 and 8051, Motorola, Inc.'s 6800 and other 8-bit processors, the vendor said.

The output from the assembler reportedly consists of an object file in Intel hexadecimal format as well as listing and error reports. Hexadecimal outputs may also be downloaded to a programmable read-only memory programming system through an asynchronous line.

The package costs \$2,500, according to a spokesman from Primarily Software, 1227 Pearl St., La Jolla, Calif. 92037.

Petro Programs For Cyber 205

MINNEAPOLIS — Two petroleum reservoir simulation programs said to maximize the vector processing capabilities of Control Data Corp.'s Cyber 205 supercomputer are available from the firm.

Vectorized Implicit Program (VIP) and Miscible Implicit Program (MVIP) are offered through the firm's Cybernet data services network on an as-used basis, as well as to users of Cyber 176 and 200 series computer systems.

VIP costs \$150,000 for Cyber 176 users and \$200,000 for Cyber 200 series users. MVIP costs \$175,000 for Cyber 176 users and \$225,000 for Cyber 200 series users, according to a vendor spokesman.

More information is available from Control Data Corp., which can be reached through Box O, Minneapolis, Minn. 55440.

IBM 3270 Users Get Release 3 of 'BMS/GT'

ATLANTA — GT Software, Inc. has announced Release 3 of Basic Mapping Support (BMS/GT), the screen generator on IBM 3270-type terminals for IBM and equivalent mainframe users running CICS.

Designed to generate fully compatible BMS maps, BMS/GT has been expanded to simplify the CICS application design when using macro or command-level programming, the company reported. BMS/GT supports "line replication," which allows the user to address a group of related lines as an array. There is no restriction on the number of fields on a line, and each attribute or data field can be addressed by an index value. With applications using CICS page-building techniques, BMS/GT

allows maps to be combined on the terminal's screen without special steps.

BMS/GT operates on any CICS/VS 1.4 or higher release without conversion. Permanent license fee is \$4,500 for IBM VSE and \$5,900 for IBM VS1 and MVS operating systems from GT Software, 1965 N. Park Place, Atlanta, Ga. 30339

Victor 9000 Acquires Loan Package

CHICAGO — Victor Business Products, Inc. has announced a loan application package for its Victor 9000 desktop business computer.

The Installment Loan Processing Package reportedly allows banks to capture all information necessary to process a loan application, to store that information and to prepare associated documentation.

Display screen formats can be created by the user and stored on a diskette for access by bank staff. A bank clerk enters information from the customer's loan application into the system, which then performs all interest, insurance and annual percentage rate calculations according to state and federal regulations and bank requirements.

Data can be transmitted to a mainframe on-line or stored on diskettes. Rates, calendar and calculation methods can be changed without reprogramming, the vendor said.

The Installment Loan Processing Package costs \$1,800 from Victor Business Products at 3900 N. Rockwell St., Chicago, Ill. 60618.

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ADR Updates 'Vollie'

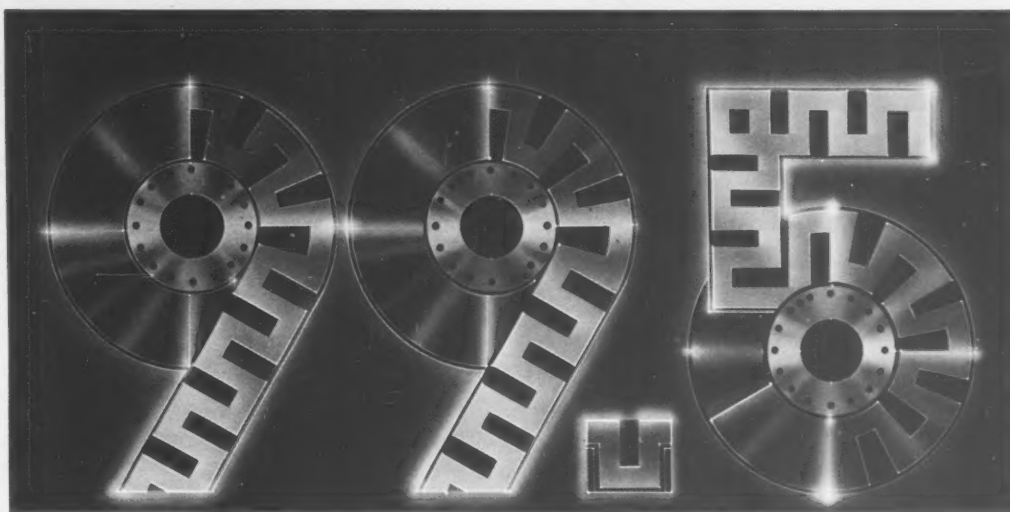
PRINCETON, N.J. — Applied Data Research, Inc. (ADR) has announced Release 3.2 of Vollie, its on-line programming system for IBM DOS/VSE sites.

The major enhancements of this version include line-editing commands, improved installation procedures, support for IBM's Power Version 2, expanded IBM Interactive Productivity Facility support and integration with ADR's Look performance measurement system, the vendor reported.

The new release also includes an extend-

ed dump facility, which supports absolute disk addressing along with the ability to position the display on a character string within a data file, library or mainframe memory. Other additions to the Vollie software are increased terminal facilities for Voice, ADR's high-level interface language.

Vollie runs on IBM 370s, 30 series, 4300s and plug compatibles. The permanent license base price for Vollie is \$18,000. ADR is located at Rt. 206 & Orchard Road CN-8, Princeton, N.J. 08540.



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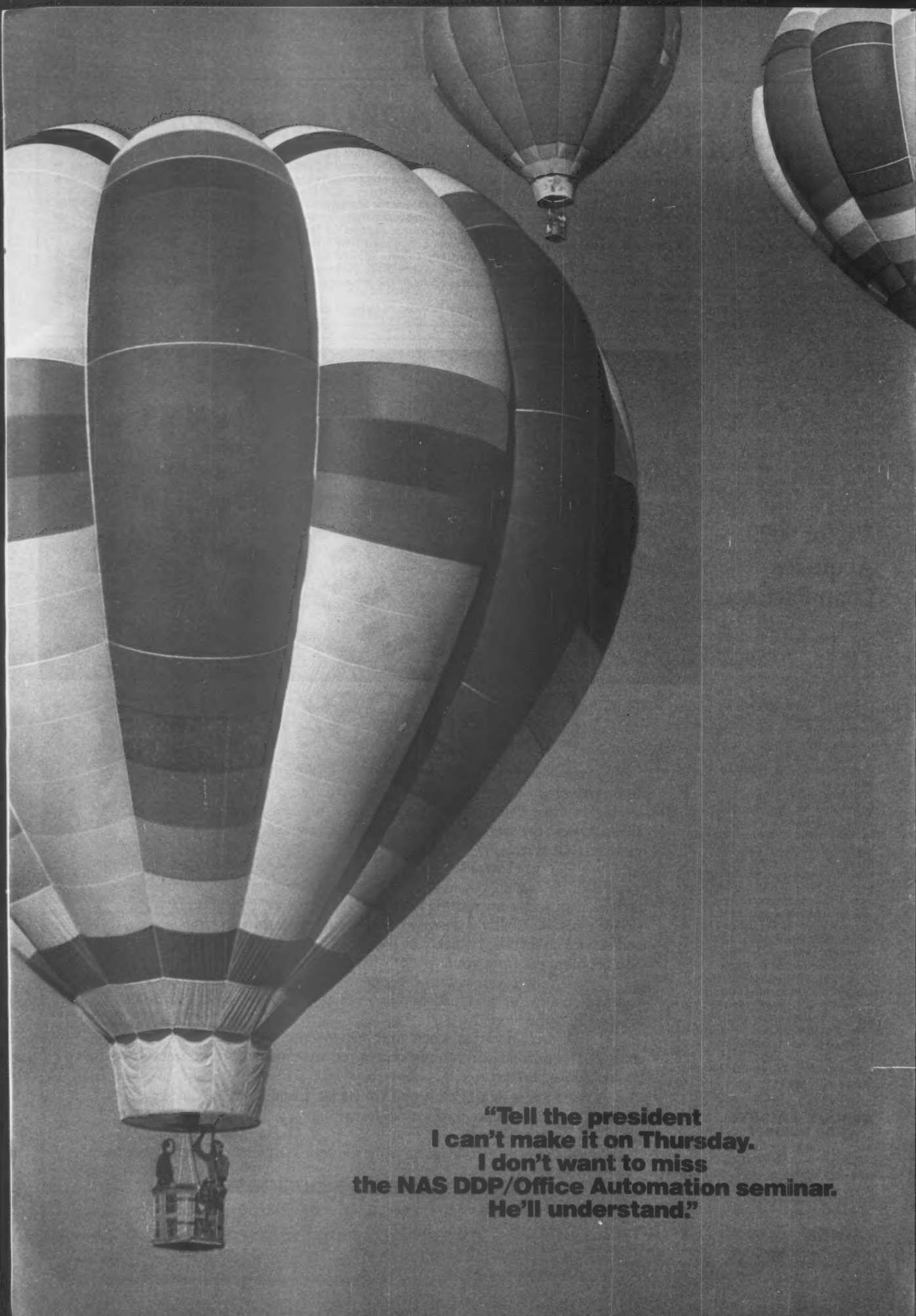
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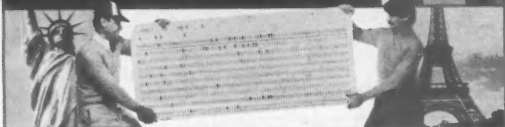
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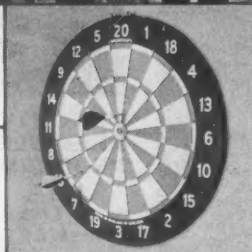
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Unix Package Announced For Gould S.E.L. Concept/32

FORT LAUDERDALE, Fla. — A Bell Laboratories Unix operating system for Gould, Inc.'s Concept/32 computers has been announced by Gould's S.E.L. Computer Systems Division.

Unix reportedly operates on the Gould Concept/32 computers in a dedicated stand-alone mode supporting asynchronous full-duplex terminals. A spokesman said it provides facilities to enter and process programs, data or documents, send mail

between users and control the hardware/software system.

The Gould S.E.L. implementation of Unix reportedly includes the kernel for task scheduling and management of data storage; shell, a command language interpreter; and utilities for program development and special system maintenance functions. An assembler and C compiler are also included.

The Unix package is available for a one-time usage charge ranging from \$9,000 for 16 terminals to \$18,000 for up to 32 terminals, the spokesman said from the firm located at 6901 W. Sunrise Blvd., P.O. Box 9148, Fort Lauderdale, Fla. 33310.

'Lawbase' Bows For DG's Nova, Eclipse Minis

THORNWOOD, N.Y. — Exact Systems and Programming Corp. (ESP) has introduced a comprehensive software system said to handle back office operations, word processing and to document storage and retrieval for law office management. The package runs on Data General Corp. machines such as the Nova and Eclipse.

Lawbase operates within the vendor's DNA-4 Information Management Control System. This data base-oriented software provides time accounting, pre-billing reports, billing, accounting and management reporting.

Prices for Lawbase range from \$7,500 for a Micronova to \$28,800 for an Eclipse and includes installation, training and documentation. More information is available from ESP, through P.O. Box 115, Thornwood, N.Y. 10594.

'Spaceman' Gets Enhancements

OAKLAND, Calif. — An enhanced version of Iconica, Inc.'s Spaceman system for space management and facilities planning has been announced by the firm.

Version II.5 is said to feature improved data handling capabilities, more efficient storage, enhanced interactive drafting capabilities and improved floor and site plan plotting capabilities.

Spaceman runs on the Tektronix, Inc. 4054 graphics computer with digitizing tablet and floppy disk. The new version costs \$750/mo or \$15,000 for a permanent license. A three-dimensional option adds \$250/mo or \$5,000 to the purchase price.

Iconica is located at 5332 College Ave., Oakland, Calif. 94618.



'Are You the One With Response-Time Problems?'

Inventory Tool Introduced For Wang VS

RICHMOND, Calif. — Soft Pro Systems, Inc. has announced a forms and supplies inventories control system software package for the Wang Laboratories, Inc. VS computer.

The software includes the following subsystems: requisition, warehouse packing/shipping, inventory control, purchasing/receipts/supplier invoice and billing/accountability.

The software is priced from \$45,000 from the vendor at 4121 MacDonald Ave., Richmond, Calif. 94805.

'Control' Update For Tandem

KNOLLS, N.J. — Network Concepts, Inc. has announced Release 4 of Control, its source maintenance and library package for Tandem Computers, Inc. computers.

Release 4 reportedly contains automatic data compression which, the company claimed, reduces disk utilization by 30%. A spokesman said seven commands were extended to operate on all files under a catalog. Release 4 reportedly also has an enhanced capability to operate over an Expand network and to detail enhancements to the user interface.

Control is available for a one-time license fee of \$8,500, the spokesman said from Two Ridgedale Ave., Cedar Knolls, N.J. 07927.

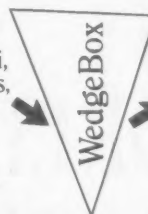
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Cobol Code Guide Out for Managers

ESTILL SPRINGS, Tenn. — A Cobol coding guide is available from Associated Technology Co. to help software departments formulate their own standards.

The 46-page Cobol reference tool is recommended to software managers, designers and quality assurance teams. It is said to provide a methodology consisting of a set of company standards and examples. These features ensure the construction of top-down programs that are structured, testable and easily maintained.

The guide costs \$20 from Associated Technology, Box 448, Rt. 2, Estill Springs, Tenn. 37330.

Dialog Users Get Training File

LOUISVILLE, Ky. — Data Courier, Inc. has announced Ontap, a training file for use with the firm's ABI/Inform business and management data base. The data base operates on Lockheed Information Systems' Dialog time-sharing system.

ABI/Inform is a segment of the Dialog data base. It costs \$15/hour to search, compared with the normal Dialog rate of \$73 for the full data base. Designed to train users to query Dialog efficiently, the Ontap package consists of 25 search questions for the ABI/Inform data base.

The ABI/Inform and Ontap are billed on an as-used basis, Data Courier said from 620 S. Fifth St., Louisville, Ky. 40202.

'Respond' Monitors Performance For DEC RSTS/E Systems

SEATTLE — A performance monitor for Digital Equipment Corp. RSTS/E systems has been unveiled here by Manus Services Corp.

Respond reportedly provides system managers with facts about what is happening within the computer system. It identifies critical resources and highlights areas where tuning can make the computer more productive, according to the vendor.

Respond instructs the system manager to adjust system-level parameters, optimize selected application programs or purchase additional hardware, as necessary, the vendor said. Respond also captures a history of activity on the system, recording what percentage of key resources

were used by each account and by whom.

This product costs \$1,800 for a single CPU, the vendor said from Lake Union Building, 1700 Westlake Ave. N., Seattle, Wash. 98109.

Finance Package Announced for VAX-11 Users

OKLAHOMA CITY — Up-Time Systems, Inc. has announced an accounting package for Digital Equipment Corp. VAX-11 processors running under the VMS operating systems and for PDP-11 processors utilizing TSX+.

The system includes separate modules for general ledger, payroll, accounts receivable, accounts payable, order entry/inventory and project control. Applications are also available for joint interest billing, revenue distribution and oil/gas lease management, a spokesman said.

The VMS package is written in Cobol and the TSX+ package is written in Cobol+. Both packages can operate in either a multilocation or single-location environment.

The eight-module package costs \$30,000, a spokesman said from Suite 200, 1140 N.W. 63rd, Oklahoma City, Okla. 73116.

Kodak Releases 'Starlink Four'

ROCHESTER, N.Y. — Eastman Kodak Co. has announced a software package that includes a bar code capability that reportedly permits users to duplicate automatically microfiche generated on the company's Komstar Microimage processors.

Starlink Four reportedly automates the duplications task and permits a Komstar processor to generate a bar code in the upper right-hand corner of each original microfiche. Microfiche are then loaded into an automatic duplicator that reads the bar code and automatically produces the requested number of copies, the vendor claimed.

Starlink will be offered at no charge to current Komstar users and will be included in new Komstar systems, according to Kodak, which is at 343 State St., Rochester, N.Y. 14650.

Theta Offers Discount On HP 1000 Software

GLENDAL, Calif. — Theta Business Systems is offering 40% discounts until Dec. 15 on software for the Hewlett-Packard Co. 1000 series systems.

The price reduction lowers the cost of the company's Pascal packages to \$1,400 from \$2,500. The discounts involve accounts receivable, accounts payable, general ledger, payroll and order entry with inventory control, the company said.

Further information is available from Theta Business Systems, Suite 106, 1110 Sonora Ave., Glendale, Calif. 91201.

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20	Manufacturer (other)
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40	Education/Training/Consultation Systems/Transportation
50	Wholesale/Retail Trade
60	Finance/Insurance/Real Estate
70	Mining/Construction/Petroleum/Refining
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90	Government - Federal/State/Local
95	Printing/Publishing/Other Communication Service
96	Other

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13	Treasurer/Controller/Finance Officer
21	Director/Manager of Operation/Planning/
22	Administrative Service
23	Systems Manager/Systems Analyst
31	Manager/Supervisor Programming
32	Programmer/Methods Analyst
41	Application Engineer
51	Mktg Sales Representative
52	Other Sales/Marketing
60	Consultant
70	Lawyer/Accountant
90	Other
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Cobol Manufacturing System Designed for DEC's 32-Bit VAXs

NEWTON, Mass. — The EDP Corp. has introduced a Cobol-based manufacturing system for Digital Equipment Corp.'s 32-bit family of VAX-11 minicomputers. The

TEC System is reportedly the first manufacturing system written in Ansi Cobol using DEC's VAX-11 DBMS data base management system, which is based on the Codasyl model.

The system includes a security system, a high-level inquiry language and report writer. According to its vendor, the system can automate

material requirements planning, master production scheduling, production control, costing, purchasing, sales order processing and the financial control functions of an organization.

The manufacturing system is priced at \$50,000. The EDP Corp. is headquartered at 30 Tower Road, Newton, Mass. 02164.

VAX-11 Users Offered On-Line DBMS

CAMBRIDGE, Mass. — A data base management system (DBMS) that reportedly offers on-line assistance to users of Digital Equipment Corp.'s VAX-11 superminis has been unveiled here by Software House.

System 1032 also offers inverted file structures for easy retrievals, a built-in block-structured programming language for application development, asynchronous I/O for optimal resource utilization and a host language interface for several languages, the vendor said.

A typical System 1032 license for a VAX-11/780 costs \$40,000, the vendor said from 1105 Massachusetts Ave., Cambridge, Mass. 02138.

'Finanswer' Fits VAX-11 Under VMS

TULSA, Okla. — Datamate Co., Inc. has announced the availability of its spreadsheet software, Finanswer, to users of Digital Equipment Corp. VAX-11 systems under the VMS operating system, as well as on DEC PDP-11 machines using RSX-11M.

Finanswer is written in Cobol and was designed for use on VT-52 and VT-100 CRTs as well as other computer terminals. The spreadsheet allows accountants and financial analysts to do budgeting and modeling interactively, the vendor said. It also operates on systems from NCR Corp., Texas Instruments, Inc., Data General Corp., Hewlett-Packard Co. and Prime Computer, Inc.

The spreadsheet features menu-based processing, English-language input, automatic saving and restoring, password protection, sorting and graphing, the vendor said. The DEC VMS or RSX-11M version costs \$995 from Datamate, based at Suite 101, 4135 S. 100th E. Ave., Tulsa, Okla. 74145.

'Forcref' Aids DEC Listing

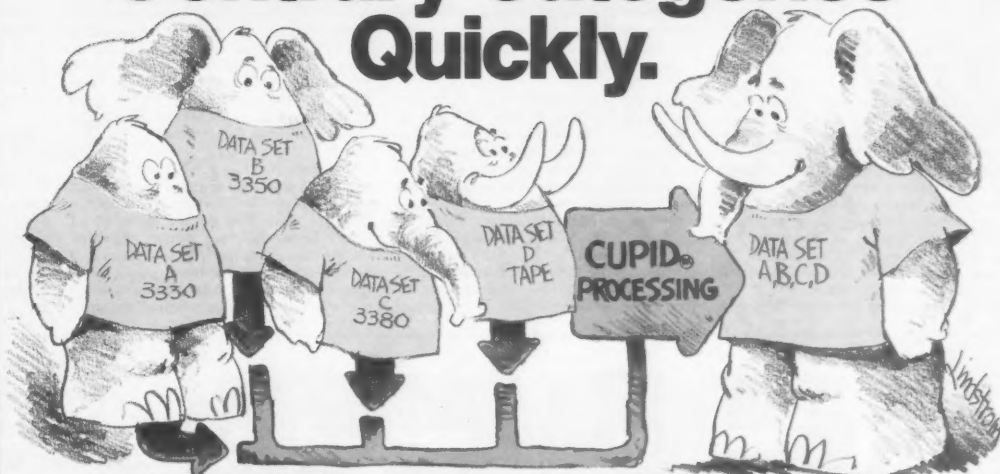
NEWTON, Mass. — Softworks, Ltd. has announced Forcref, a software product said to allow Fortran programmers to produce a program cross-reference listing of any Digital Equipment Corp. VAX-11 Fortran program.

Forcref also enables a programmer to generate backward/forward cross-reference pointers on a line-by-line basis and to resequence statement labels, a spokesman said.

The cross-reference includes subprograms and arrays listed in order of occurrence, an alphabetical list of statement numbers cross-referenced to the line numbers on which they occur, an alphabetical symbol listing cross-referenced to the line numbers on which they occur, according to a Softworks spokesman.

Forcref costs \$800 from 114 Grasmere St., Newton, Mass. 02158.

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\$450, but you'll be saving money and time. The increase in your site's efficiency will more than pay for the low cost of CUPID. Call your local Control Data Peripheral Systems representative or call toll-free 800/328-6207 with your purchase order and CUPID will be there when you have to concatenate without abends. No matter how contrary your categories are.

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Micro Notes

Xyzt Computer Dimensions, Inc. has announced a **Library Support Option (LSO)** file management system for Radio Shack TRS-80 microcomputers. The package provides the capability to create and maintain libraries for logical organization of files and programs, the company reported. LSO is transparent to the all TRS-80 DOS operating systems and application programs and works with TRS-80 Models 1/III. It is available for \$79 from Xyzt Computer Dimensions, Suite 1500, 2 Penn Plaza, New York, N.Y. 10121.

International Software Enterprises, Inc. has announced two applications software products said to complete a triad of software tools aimed at the applications development and OEM systems integrator markets.

The **"C" language compiler** is intended to assist systems programmers as well as to provide applications developers with facilities for building application software, the vendor claimed. The compiler is compatible with the Radio Shack TRS DOS, Zilog, Inc. Z80, Digital Research, Inc. CP/M and Intel Corp. 8080 and 8085 environments, the company said.

Screen Master is an interactive screen management system for minicomputers and microcomputers and was designed specifically for professional applications developers. The software consists of two languages, the company's Screen Description Language, which enables the application developer to define screens that will appear to end users of an application; and Screen Manipulation Language, which extends the screen-handling capabilities of a programming language by allowing an application developer to control the dynamics of screen usage, the vendor claimed.

The C compiler is priced at \$575 and

Screen Master from \$2,030 to \$21,650, depending on single-user or multiuser versions chosen from International Software Enterprises, Inc., 350 W. Sagamore Pkwy., West Lafayette, Ind. 47906.

A **Cobol compiler** for the IBM Personal Computer has been announced by mbp Software and Systems Technology, Inc. System requirements for the compiler include at least a 5M-byte hard disk, 128K random-access memory (RAM) and the Digital Research, Inc. CP/M-86 operating system. The compiler costs \$500 from the firm at Suite 626, 7700 Edgewater Drive, Oakland, Calif. 94621.

Rair Microcomputer Corp. has announced **MP/M II+**, a multiuser operating system for its Black Box 3/50 microcomputer. MP/M II+ is said to provide for memory expansion to 1M byte, an enhanced virtual disk option and a disk cache memory. It is free with the 3/50, which carries a base price of \$9,500 from the firm at 4101 Burton Drive, Santa Clara, Calif. 95050.

A **Medical Data Management System** for Digital Research, Inc. CP/M-80 or Microsoft, Inc. MS/DOS-compatible systems has been announced by Solid Software, Inc.

The software features patient/guarantor record keeping, billing, accounts receivable, physician transaction analysis and patient scheduling. The package is said to provide daily reports and features a flexible formatting scheme for processing insurance forms.

Written in Microsoft, Inc.'s Basic, the software costs \$1,495, including documentation and a five-year warranty against coding errors. The vendor is located at Suite 501, 5500 Interstate N. Pkwy., Atlanta, Ga. 30328.

Insoft, Inc. has announced an interface which enables its Graforth Apple II graphics language to support the Hewlett-Packard Co. 7470 plotter. The enhancement reportedly enables users to produce three-dimensional graphics plotting and multiple-character sets and sizes. **Graforth** is a language for entertainment and educational software creation, featuring three-dimensional color animation graphics including rotation, scale, transposition and perspective. Graforth costs \$75 and the HP interface costs \$25 from Suite 202B, 10175 S.W. Barbur Blvd., Portland, Ore. 97219.

Sparacino Associates, Inc. has announced an enhancement to its **Udraw** graphics software system for the Hewlett-Packard Co. 9845B/C desktop computer. The enhancement eliminates the Udraw user's need for the HP 9111A graphics table, offering the option of a keyboard, light pen or graphics tablet.

At the same time, the company announced two new Udraw-related products. The **XY Chart Udraw Utility** allows preparation of Udraw-compatible x-y charts. The **Plot Udraw Utility** provides additional plot capability using an additional font for text and allows independent off-line plotting. Udraw costs \$1,000, the XY Chart Udraw Utility costs \$250 and the Plot Udraw Utility costs \$250 from Sparacino at 175 Blackberry Drive, Stamford, Conn. 06903.

Microrim, Inc. has announced a microcomputer data base management system which reportedly offers the same user to interface from 8-bit micros up to 64-bit Cray Research, Inc. supercomputers. Called **Microrim**, the interface allows up to five concurrent retrieval paths, each with capacity of up to five fields for sorting and 10 fields for selection criteria, the

company claimed. Other features include English-like commands, comprehensive help and error messages and the capability to search and sort multiple fields, retrieve data from several files and interactively change the data base structure. The system operates on Digital Research, Inc.'s CP/M for 8-bit Intel Corp. 8080/8085 and Zilog, Inc. Z80 microprocessors and costs from \$595 to \$1,295, depending on options. Microrim can be reached through P.O. Box 585, Bellevue, Wash. 98009.

Altos Computer Systems, Inc. has announced a command interpreter, called the **Altos business shell**, that offers Bell Laboratories' Unix operating system capabilities to users of the company's 16-bit Intel Corp. 8086- and Motorola, Inc. 68000-based microcomputers. The interpreter reportedly allows users to run Unix-based word processing, accounting, file and data management and system administration. The menu-driven interpreter offers compatibility with most RS-232 terminals; menu customization capability; a utility to simplify user-administration procedures and three sets of menus geared to different levels of user. The shell is standard on Altos' Xenix/Unix implementation, which costs \$995, a spokesman said from 2360 Bering Drive, San Jose, Calif. 95131.

Micro Architecture, Inc. has introduced an interactive data manager for the IBM Personal Computer running under IBM PC-DOS. **IDM-XI** features built-in sort/merge, support string, double-precision floating decimal, integer and date, formatted numeric fields and a report writer. It is available for \$398 from the vendor at 96 Dothan St., Arlington, Mass. 02174.

(Continued on Page 68)

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Service Firm Offers Time-Sharing, Batch Support

NORTH STONINGTON, Conn. — Computer time-sharing and batch support services and a variety of consulting and other specialized services are being offered by Analysis and Technology, Inc. (A&T).

The company's main facility includes a Digital Equipment Corp. VAX-11/780 scientific minicomputer and a Data General Corp. M/600 business system for users. Both machines support a variety of business and technical languages and are themselves sup-

ported by disk and tape drives, printers, plotters and graphics terminals, the firm said.

A&T also offers a variety of special scientific subroutine libraries, tools for data base development; graphics packages and applications packages for word processing; and spreadsheet, project and program management, according to a vendor spokesman.

For further information on the services, contact A&T, Technology Park, P.O. Box 220, North Stonington, Conn. 06359.

Billing Module Released For Tymshare Bank System

CUPERTINO, Calif. — Tymshare, Inc. has released the first module of a two-part Customer Profitability Analysis System, an on-line system that will be available on a time-sharing basis. The on-line system was developed to assist banks in measuring commercial account profitability.

The billing module automatically generates statements containing lists of services, units consumed, unit total prices and amounts owed the bank, according to the vendor. The statements come in three formats: balance, fee/balance and fee. They

can reportedly be issued as invoices to customers or as memos to accounts officers and can cover monthly, quarterly or year-to-date periods.

The second module, management reporting, is scheduled for release in the first quarter of 1983.

Costs for these time-sharing services are based on transaction time and volume. Tymshare is located at 20705 Valley Green Drive, Cupertino, Calif. 95014.

Citibank Data Base Available on Rapidata

FAIRFIELD, N.J. — The Rapidata Division of National Data Corp. has announced the availability of the

Citibank Forecast Data Base on its remote-access computer system.

The Citibank Forecast Data Base is

an on-line version of Citibank's quarterly *United States Economic Forecast*. It provides a five-year forecast by quarters for over 200 of the most important economic indicators, including fixed business investments, corporate profits, employment, energy and so on.

The Data Base is an integral part of the print services of the Citibank Economic Forecast Service and is being offered in conjunction with them. Annual subscription to the Data Base and print service costs \$4,900, and the on-line data base alone costs \$2,400/year. Further details are available from Rapidata at P.O. Box 1049, 20 New Dutch Lane, Fairfield, N.J. 07006.

Software Provides Access to 'Merlin'

ROSLYN, N.Y. — Remote Computing Corp. (RCC) is offering software said to allow investors with microcomputers to access the firm's Merlin data base.

Merlin includes daily and historical prices for securities, commodities and options. Dial/Data reportedly features statistical modeling, portfolio management and the ability to create charts of stocks.

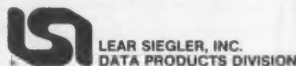
RCC has developed Apple Computer, Inc. Apple II-compatible software, or users may write their own software interface following an RCC manual, a spokeswoman said. Dial/Data is priced at a minimum of \$45/mo. The firm is located at 1044 Northern Blvd., Roslyn, N.Y. 11576.



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Micro Notes

(Continued from Page 64)

Aton International, Inc. has announced the availability of Digital Research, Inc.'s CP/M Version 2.2 operating system on Radio Shack's hard disk drives for the TRS-80 Model II and Model 16 microcomputers. The Aton CP/M is memory-space efficient, using 16K bytes of controller random-access memory (RAM) and 2K bytes of CPU memory, leaving 62K bytes of RAM in the CPU for processing, the company said. For programs requiring dual floppies or dual

hard disks, the total formatted capacity of 8M bytes may be divided into user-specific logical drives that simulate multiple drives, Aton said. The Aton CP/M is priced at \$279 from Aton International, Inc., 26 Brooklyn Ave., San Jose, Calif. 95128.

The Gauge Group has unveiled Softcable serial printer spooling said to give users of IBM's Personal Computer the processing time normally lost to printing delays, while helping users sidestep serial printer interfac-

ing. Softcable interfaces all common serial printers to the Personal Computer with only one standard cable definition, while adapting to the control lead and protocol requirements of the various printers by software reconfiguration alone, the company claimed. Softcable is priced at \$59.95 and is available from Gauge Group, Box 34082, Phoenix, Ariz. 85067.

Nexus has introduced a screen handler and report generator that will run on any 24 by 80 As-

cii or Ansi terminal and on any 8-bit, 48K-micro running Digital Research, Inc.'s operating system, CP/M. Zip can be used to produce invoices, time sheets, inventory listings and other forms as well as menus for application programs and data input screens, a vendor spokesman said. The package is available for \$160 from the vendor at Suite 802, 5455 Wilshire Blvd., Los Angeles, Calif. 90036.

Ferox Microsystems, Inc. has introduced a version of its

Graphpower business graphics package that will support the Hewlett-Packard Co. 7470A two-pen plotter. The package will run on the IBM Personal Computer or Apple Computer, Inc.'s Apple II and Apple III. The package can create line, pie, bar, stacked bar, side-by-side bar and financial report charts. It is available for \$295 from the vendor at Suite 611, 1701 N. Fort Myer Drive, Arlington, Va. 22209.

Peachtree Software, Inc. has introduced two add-on modules for its Peachtext Word Processor, which runs under the Digital Research, Inc. operating system, CP/M. The Random House Dictionary allows users of the package to check their documents for misspelled words and typographical errors. The Random House Thesaurus is said to provide writers with control over word selection. The user can engage the thesaurus, enter a reference word and see a list of synonyms displayed on the screen. The dictionary is free if the \$500 word processing package is bought before Nov. 30; the thesaurus is available for \$100 from the vendor at 3445 Peachtree Road N.E., 8th Floor, Atlanta, Ga. 30326.

Digital Equipment Corp. has announced the availability of a software package designed to streamline business application programming on its microcomputers by automatically generating Ansi 74 standard Cobol code. The Cobol Program Generator runs on DEC's VT180, Rainbow 100, Decmate II and Professional 300 personal computers. It combines a dictionary containing file, field and program definitions with Cobol source code generators to produce entire programs for most commercial applications, according to the vendor. It costs \$1,495. Further details are available from DEC at 146 Main St., Maynard, Mass. 01754.



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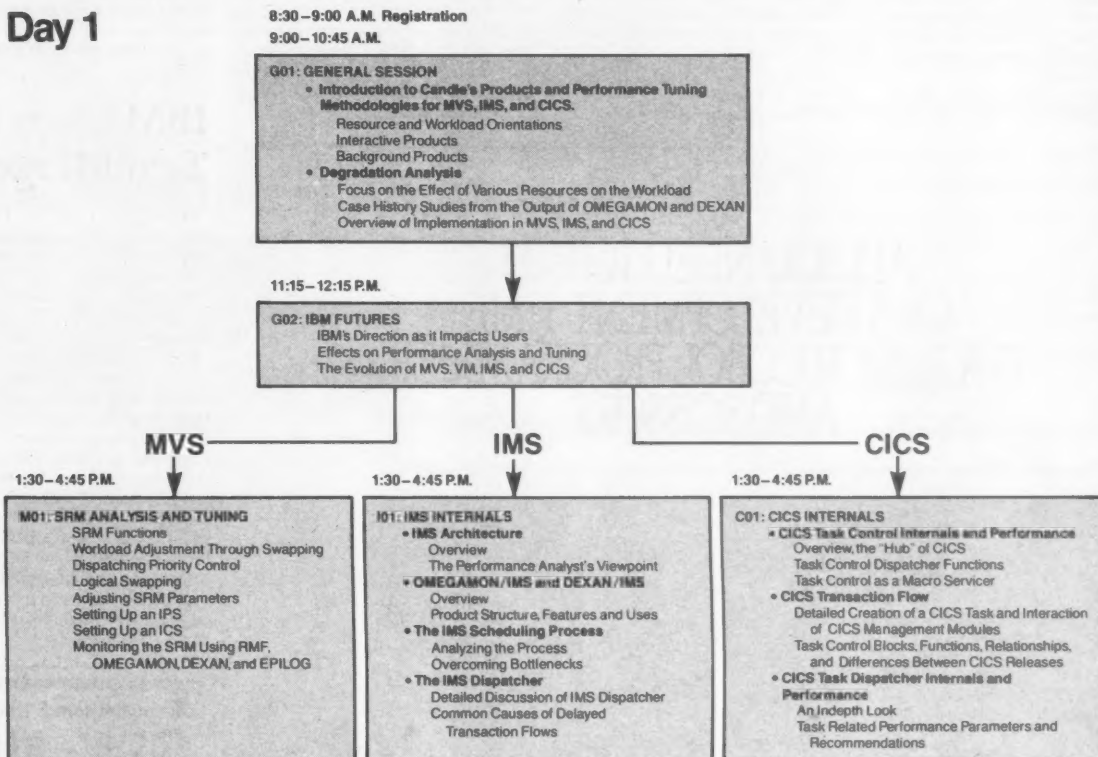
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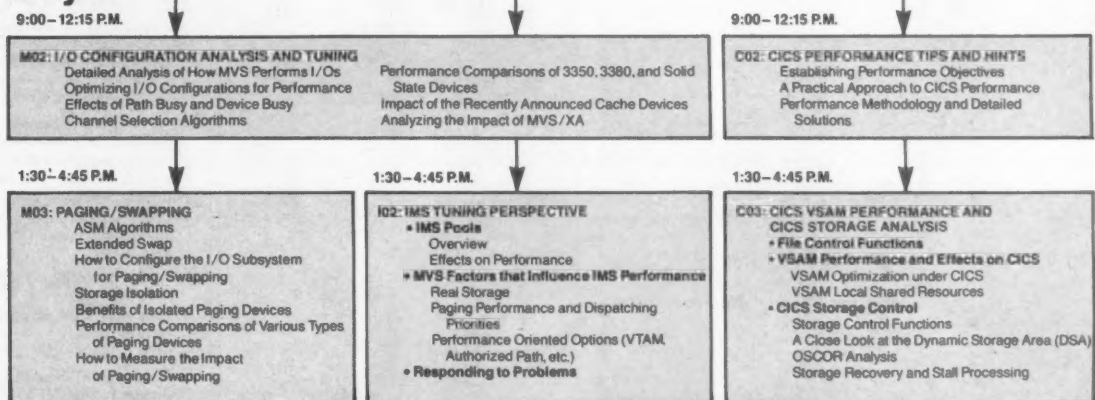
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Directory Listing System Bows for NCR's Criterion

SAN DIEGO — Intrak, Inc. has announced a directory listing and maintenance system for users of NCR Corp.'s Criterion systems running under the Vertical Resource Executive (VRX) operating system.

Called Direx, the package reportedly allows combined directory listings of up to five disks. The format can be listed by disk image, file name, file size or creation date, a spokesman said. Disk contention time is reduced by the use of trunk positioning unit locks and the VRX Cobol Sort, reducing I/O count by as much as 80%, the company claimed.

The spokesman said that a unique feature of Direx is its ability to gener-

ate a source program utility routine file in the sequence of the report, which can be used to lock, unlock, delete and copy files.

Direx is available for \$1,000 from Intrak at 9999 Business Park Ave., San Diego, Calif. 92131.

Honeywell Users Get Text Editor

EL CAJON, Calif. — A full-screen text editor (FSTE-6) for users of Honeywell, Inc. DPS 6 and Level 6 minis is available here from the Israeli-based Athena Software Services & Consulting.

FSTE-6 provides over 60 edit and word processing functions.

Henco Announces 'Info-Interface' For Transfer to Financial 'Model'

WALTHAM, Mass. — Henco Software, developers of the Info relational data base management system and reporting package, has announced an Info-Interface to Model, a financial modeling software package from Lloyd Bush & Associates.

The interface reportedly allows us-

ers to transfer between concurrent Model and Info sessions. It also enables users to transfer data either directly or via intermediate files, according to the vendor. This product is intended for production applications or on an interactive ad hoc basis.

Info-Interface to Model is available on Prime Computer, Inc. minicomputers and Digital Equipment Corp. VAX-11 systems. The interface is priced at \$3,000. Info costs \$9,800 and Model is priced from \$9,000. Further details can be obtained from Henco at 100 Fifth Ave., Waltham, Mass. 02154.

IBM Users Get Text Merger

BURBANK, Calif. — Cadam, Inc. has introduced a software package that is said to merge graphics and text information.

It will run on any IBM or IBM-compatible machine, a vendor spokesman said.

The Text Processing Interface Module software eliminates the need for cutting and pasting in a range of technological publication applications, interacting between files created on the graphics terminals for design and alphanumeric terminals for documentation, a vendor spokesman said.

The package is available for \$7,300 to buy and \$220/mo to lease with a \$660 initial fee. More information is available from Cadam, which is located at 1935 N. Buena Vista St., Burbank, Calif. 91504.

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IN DEPTH

Distributed DSS

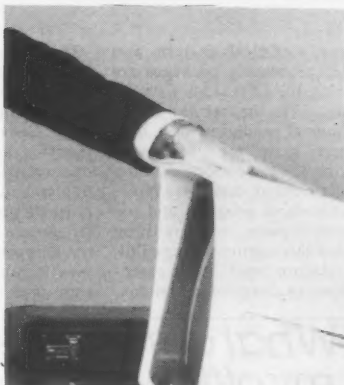
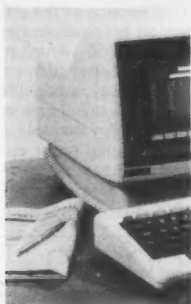
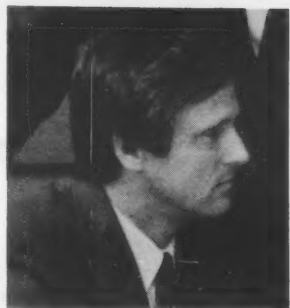
By Warren G. Briggs
And
C. Lawrence Meador

A close look at the evolving microcomputerware and user considerations for decision support systems, including trends in DSS development and a proposed corporate micro policy.

The phrase "decision support systems" (DSS) has, according to at least one of its originators, become nearly meaningless. As with distributed data processing (DDP) in its day, DSS has undergone the familiar user cycles of dazzlement and disillusionment that precede balanced successes.

Now, recent hardware and software progress is making possible a melding of the two: distributed DSS. Evolving computer hardware, particularly microcomputers, will be better able to meet the economic and end-user pressures for coordinated and connected localized systems for a wide variety of executive information support applications. These pressures, plus the less structured and often ad hoc applications typical of DSS, suggest this distributed mode will occur more rapidly than it did with the earlier data processing applications.

Most definitions of DSS include computer-supported tasks from simple data retrieval, through several levels of analysis and modeling, to complex risk assessment and optimization models. The computerware involved can range from the Osborne Computer Corp. portable for less than \$1,700, including modest software, to the very powerful Express (Management Decision Systems, Inc.) and Xsim (Chase Econometrics/Interactive Data Corp.) packages costing \$150,000 to \$300,000, plus at least as much for adequate hardware and still more



IN DEPTH

for data collection and applications development.

The attraction of distributed DSS, as with distributed DP, is that many applications can upon occasion function with systems all along this spectrum. Rather than staying at one level of capability and expense, a distributed system calls upon what it needs only when it's needed. William R. Synnott and William H. Gruber argue that "distributed processing seems to offer the best of both worlds: the advantages of centralization and decentralization without the disadvantages of either; that is, a means of effecting corporate coordination and control without disturbing local autonomy and of allowing an organization to pattern its information systems after the organization's structure, to follow the business as it is really conducted" [*Information Resource Management*, John Wiley & Sons, 1981].

While the concept is appealing, the interfaces along this spectrum are still difficult to accomplish. The demand is obvious and is encouraging vendors toward the developments mentioned below.

Personal Computing

Microcomputers have arrived, in rapidly increasing quantity, variety and cost/performance. No other industrial or consumer product in history has experienced such rapid growth. The current and continuing annual rates are extraordinary: 40% growth in units sold and 16% improvement in cost/performance, according to Howard Anderson of The Yankee Group. The entry of major brands now brings respectability, reliability and marketing sophistication to elevate these tools from the "personal" to the "professional" computer category. The recent coalition of the colossi, IBM and Sears, as well as entries by Digital Equipment Corp. and Xerox Corp., suggests this personal computing business is serious.

While the established pioneers and the big brand entries scramble for market share, a new "hot box boom" will bring another jump in cost/performance expectations. These super-micros, some using the Motorola, Inc. 68000 chip and 12M-byte hard disks, are approaching real micro mainframes in the \$10,000 to \$20,000 price range. Some rumored developments by big names (DEC's micro-VAX, Apple Computer, Inc.'s Lisa and Prime Computer, Inc.'s Rabbit) may accelerate this threat.

Software Surge

Accompanying this rapid hardware progress has been a similar proliferation of software tools addressing the wide spectrum of alleged DSS applications. This surge comes from many directions. From the small micro end we see the inevitable Visi-Clones extending the all-time best selling package: Visicalc, developed by Software Arts, distributed by Visicorp.

Data base, statistical analysis and even word processing packages are confounding the DSS label. Competition intensifies among the traditional financial modeling data base and report generator mainframe packages as their vendors develop varying distributed concepts. While all this stimulates progress and excites the marketplace, it does nothing for the standardization, compatibility or interfacing capability so essential for effective distributed systems.

The challenge of interfacing among DSS tools is even greater than it was for distributed DP because of the different philosophical approach to systems development. DSS development is ad hoc, end-user driven, opportunistic and quite impossible to plan and schedule to the degree of most DP applications. For example, a DP system for distributed order entry, shipping and billing, while complex, is much easier to define and design than a DSS for a marketing

executive would be.

In spite of the rapid introduction of DSS-related software tools, the progress toward compatibility, interfacing and a true distributed systems capability has been slow. Most vendors proclaim compatibility and ease of interface for their products, yet this is often accomplished only through reformatting diskettes, transferring raw data files or by simply having the micro emulate an appropriate mainframe terminal.

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Innovative entrepreneurial competition seems not to encourage the interface standards so needed for the development of efficient distributed DSS. There is no move yet toward a "Conference on Decision Support Languages" — Codesul. But then such efforts are exhausting and have not always been notably useful.

Up, Down and Across

Development of DSS tools useful in a distributed context is quite appar-

ently happening in all directions. That is, the micro-based systems are reaching up to interface the larger models and data banks, while the larger packages are moving down with subsets of linkages for the micros and supermicros.

At the same time, interconnections among networked micros, and time-shared multiple access to centralized models and data files, service important applications. At least 10 DSS software vendors indicate that all are

at some stage in developing a micro-based and/or micro-interfaced version of their package. These packages include Cuffs (Cuffs Financial Planning & Models, Ltd.), EIS (Boeing Computer Services), Empire (Applied Data Research, Inc.), Express, FCS-EPS (Evaluation and Planning Systems), IFPS (Execucom Systems Corp.), Model, Simplan (Simplan Systems, Inc.), Stratagem (Integrated Planning, Inc.) and Xsim.

While few specifics are available on

these highly competitive efforts, it is apparent that some interesting options are forthcoming. FCS-EPS Version 2.0 is available on micros using the C language and runs on the Onyx Systems, Inc. and Northstar Computer, Inc. supermicros. Integrated Planning is now building a version of Stratagem in the C language which will run on machines such as the Fortune 3216 and the DEC VAX architecture.

Execucom plans to offer a spectrum of products based on IFPS on machines similar to the IBM Personal Computer up to large mainframes with full vertical compatibility. Execucom expects the unit cost to a major corporation at significant volumes to be highly competitive to alternate micro-based offerings.

Empire has a data analysis subset operating on micros. Both Chase Econometrics/Interactive Data Corp. (CE/IDC) and Data Resources, Inc. (DRI) are building interfaces for micro packages to download data from the huge files maintained by those organizations.

The emerging low-cost supermicros — like Charles River Data Systems' recent entry incorporating two M68000 chips — can accommodate a clever reformulation of these established mainframe packages. This raises the interesting question of how to market a \$50,000 to \$300,000 package to run on a \$5,000 to \$30,000 supermicro, as will be discussed below. Of course, even the 20M-byte micro hard disks don't approach some DSS needs for data access and interactivity. Hence the need for true distributed capability is evident.

Concurrent with this move down by the mainframe-based systems is the escalation of the micro-based systems. Accompanying the marketing cry of "toys becoming tools" are the 16-bit processors, local hard disks and improved telecommunications interfaces. The enhanced spreadsheet generators, data base manipulators, statistical and graphics packages appear at a frightening rate. Several hundred such packages were on display last week at Info 82 in New York.

Downloading and Distribution

Significant yet disparate shortcomings of both the smallest and largest computer systems are being overcome by the distributed procedure of downloading data. Small systems obviously have limited storage capacity, yet patience plus a library and courier service of diskettes can relieve some of this constraint. Of course, "small" is relative when some DSS applications involve downloading onto a supermicro several megabytes selected from huge time-shared files of economic time series, financial reports and census data.

This downloading of data not only enables more substantial tasks on small systems, but also reduces incremental charges for processing on the

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larger systems. The rapid hardware and software developments mentioned earlier apply mostly to the cost/performance of computational tasks. Relatively less progress is seen in data storage for the micros. Of course, this technology will never solve the problem of original data entry, updating, authentication, auditing and security — all functions with important economies of scale. In fact, those functions are often considered a separate industry.

The enhanced processing power of micros can, with the software now available, quite adequately relieve the minis and mainframes of the highly interactive, time-consuming tasks of model entry and edit, graphical data browsing, report reformulations and the repetitive "what-if?" calculations typical of DSS applications. It is apparent that only a fraction of the total connect time and overhead charges on large computers is truly necessary for many DSS

tasks, yet occasional access to large updated data files and considerable computing power is critical. It is useful to note that the traditional intermediary role of minicomputers is threatened by this micro-mainframe interface development.

This is good news to corporate MIS directors whose mainframes are becoming burdened with DSS time-sharing tasks. But this distributed trend brings new marketing and pricing challenges to the time-shar-

ing vendors whose metered costs have driven many users to the micros. Of course, time-sharing vendors of raw computing power saw long ago that the market was doomed. The short era of strictly mainframe-based DSS models is now passing, leaving the time-sharing firms to die or to service the distributed mode.

The large vendors of financial and economic data, like CE/IDC and DRI, are finding their clients downloading data for crude or even manual entry to micros. Each of these major data vendors has, in fact, recently announced software and services to facilitate downloading linkage to Visicalc on the Apple, as well as to larger spreadsheet generators on the 16-bit micros.

The Multiplanner package by Microsoft as adapted and marketed by CE/IDC provides a data bridge from the IBM Personal Computer to the huge files and Xsim package at CE/IDC. It also provides a similar linkage for Visicalc on the Apple II micro. DRI's Drilink ties the Onyx supermicro, with Supercomp and other DSS packages into their full resources. The Datakit service soon to be available from DRI will provide for low-cost metered access to DRI files for the small micro users.

Marketing DDSS Tools

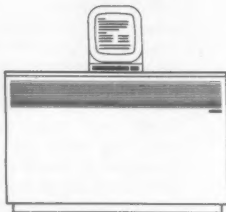
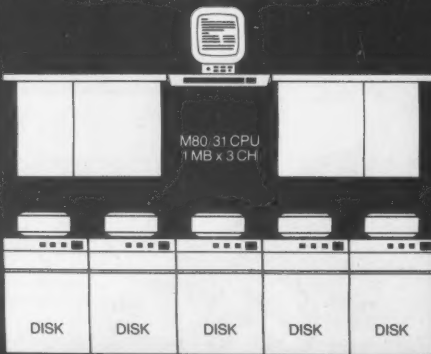
The hardware and software technology for distributed decision support applications continues to progress relentlessly. But the marketing issues — prices, channels, media — remain confused. The channels for the new professional microcomputers are shifting as the industry seeks some middle ground between the neighborhood computer store, with its technical and "special price" orientation, and the traditional mainframe sales force, with its full-service, highly personal focus.

A price/profit squeeze is inevitable as higher level, less technical users come to expect the services of the mainframe and mini tradition and the prices and product innovations of the hardware shops. The institutional microcomputer policy suggestions described below will help in this process for large organizations considering micros as part of an overall system. In some instances, the hardware shopping task will be done by the software vendors and/or consultants, with the computer hardware shop simply doing installation and maintenance.

The software marketing issues are even messier. As mentioned earlier, some micro-based packages under development will soon challenge the capability of the \$50,000 to \$150,000 products. While the value may still be there for an end user, it is still difficult to sell software for tenfold the price of the host hardware. Yet the spectacular cost/performance of supermicros does not help amortize the development, documentation, selling and servicing costs of this more

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IN DEPTH

powerful and user-friendly software.

One answer seems to be more unbundling of software prices into incremental modules of capability and separate charges for training, consulting, documentation and so on. The Lloyd Bush package, Model, was one of the first to offer increments of capability from \$9,000 to \$200,000. The new version of FCS-EPS ranges from a \$2,000 micro CP/M version through a \$5,000 supermicro Unix version and a \$25,000 Wang VS package, to \$150,000 for the full mainframe version.

Then come further options and extensions. The vendors of both Cuffs and Stratagem are developing versions of their product for the supermicros, but have not announced prices or delivery dates. Express and Simplan are likewise candidates for interfacing with this new technology.

The obvious initial market for these micro-based DSS packages is among Fortune-500-size clients. Most of these large applications will involve distributed DSS, with many micros interfacing with a mainframe or time-sharing service and possibly with each other as a local network. The marketing channels are therefore not much different, and single-copy prices for micro packages become somewhat meaningless as clients negotiate for complete systems.

The growth of micro networks and the use of micros as terminal emulators raise the question of how many copies of the software really exist, so even price discounts for quantity purchases lose impact. In fact, some vendors are considering metering usage of a networked package rather than attempting to count copies residing on the micro "executive workstations." The object, of course, is to capture in the pricing scheme some aspect of the product's value to end users. Again there is the pressure to keep competitive as the existing mainframe-supported customers discover the micro-based alternatives.

As this marketing of DSS software tools moves outside the Fortune-500-size users, security and copyright issues take on new dimensions. The software industry must realize that the greatest protection of software rights lies in the traditional integrity and internal controls of the data processing professionals in large organizations, rather than in any legal or mechanical devices. The independent micro user has quite a different attitude, as the rampant bootlegging of diskette copies among "computer-nicks" indicates. The prices of these powerful micro DSS packages are getting high enough to test the integrity of some serious users.

Of course, some packages incorporate ingenious copy protection. The Micro DSS/Finance package (developed by Ferro Microsystems, distributed by Addison-Wesley at \$1,500 per copy) has a micrologic key embedded in the Apple computer slide-changer attachment. The FCS-

EPS micro version for \$2,000 includes a clever "blue box" micrologic security attachment. Yet these devices may simply challenge the new generation of microprocessor locksmiths. Vendors accustomed to dealing with corporate computer professionals must beware of this new environment.

End-User Needs

Recent research on information system end users suggests that decision

support systems are near the top of many users' priority lists. However, the same users rated the DP support they were receiving for DSS development as very low in quality.

Although the DSS philosophy focuses on the end user as the principal source of design direction, few DSS developers are, in fact, skilled in the general processes of end-user characterization, needs assessment and problem diagnosis. Very little research data exists on common prob-

lems, widespread needs or even effective methods for determining these key variables in specific organizational settings, especially in situations that require distributed DSS development.

As DSS developments become more numerous and diverse, the complexity and diversity of DSS managerial end-user needs are likely to increase. Thus, the demands on DSS tools for accommodating a wide variety of end-user needs, especially in distrib-

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uted applications, will become more challenging.

We recently conducted a survey with Martin Guyote and Peter Keen of managerial DSS users in a wide range of organizations in order to

identify critical DSS development factors and managerial end-user perspectives on problems and needs. The survey indicates several trends in DSS development and use that are of particular

relevance for distributed DSS applications.

A total of 18 firms and 30 DSS were represented in the survey from a variety of industries. The firms varied in size from organizations with

annual revenues of a few million dollars to others with revenues of several billion. A large majority of the respondents characterized their firms' strategic environment as turbulent and dynamic.

Few DSS users seem to come from placid business environments.

Respondents' departments fell into 10 categories, with the four largest groups in marketing, management information services (MIS), planning and finance. The dynamic nature of the strategic environments, combined with the diversity of DSS applications, points to a need for considerable flexibility in the design and deployment of DSS tools.

By and large, the managerial respondents in our sample had more extensive experience with computer systems than one might expect. It is not surprising, then, that they also held favorable attitudes toward computers. They tended consistently to be of the opinion that computers can increase the effectiveness of senior managers.

User managers were asked to evaluate the importance and performance of seven specific DP department characteristics and skills. The characteristic ranked most important was sensitivity to users' needs. The dimension achieving the highest performance evaluation was willingness to work closely with users. The skill in which DP departments were evaluated as being least effective was expertise in design of analysis-based systems like DSS and knowledge of user departments' operations. This result suggests a clear marketplace for user-controllable distributed DSS.

The survey included widely different types of systems. The languages used to build the DSS included Basic, Fortran, Cobol, PL/I and APL, as well as more specialized languages such as Express, IFPS, Focus, EPS, Empire and Xsim. About half of the systems had been in use for nine months or less; also, about half of the systems were used at least once a week on average. In most cases, the direct users of the systems were staff personnel, with top management using the systems through intermediaries.

Respondents' average ratings of the importance of the specific DSS design features and their ratings of the performance of their own systems on these features showed strong agreement on the importance of general features such as system adaptability, ease of learning and use, and integration of all components under a sin-

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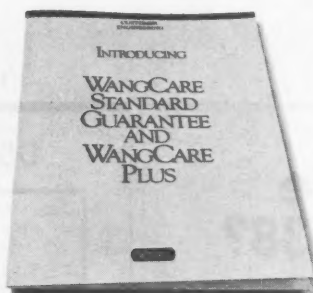
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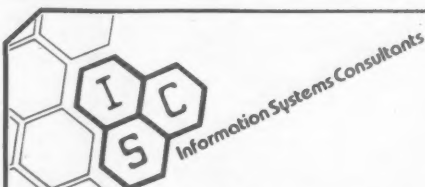
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DSS Development Life Cycle

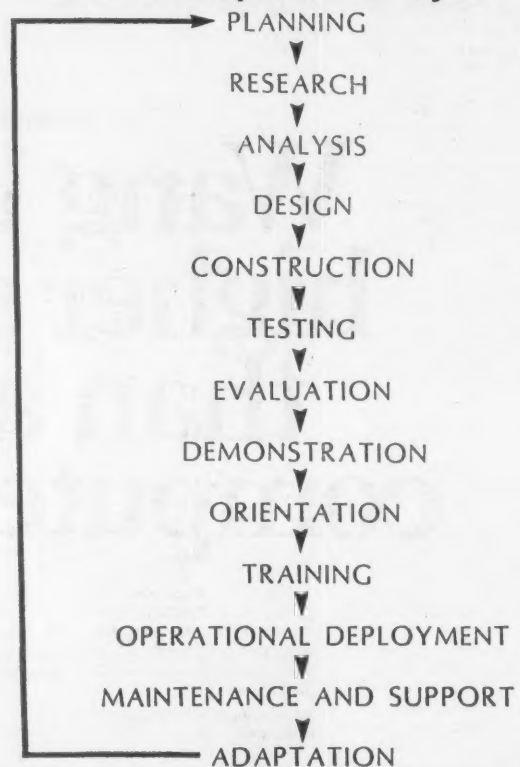


Figure 1

gle command language. Few, if any,

microcomputer-based DSS languages currently integrate all necessary functions under a uniform command structure so that considerable additional work is needed here.

Common priorities concerning data base characteristics stressed security, which can be provided effectively with microcomputer architectures, plus needs to support large and complex data bases with many dimensions and variables. This, of course, suggests a need for the distributed systems capability to communicate with mainframes. Among the remaining features, the highest priorities go to sophisticated graphics and report formatting capabilities, capabilities for performing what-if and sensitivity analyses and overall user-friendliness.

Respondents were generally satisfied with the data base characteristics of their systems. The three features of security, data base size and complexity were also among the highest rated features in terms of system performance. The decision support systems also received relatively high marks for data base expandability and display formatting. The lowest marks were reserved for the available analytic and mathematical functions and, to a lesser extent, model-

ing features of the systems.

On ratings of several measures of DSS "success," respondents generally agreed that successful systems had resulted in substantial time savings, had been cost-effective and would continue to be successes. However, respondents were unsure about how well the DSS fit with the "politics" of decision making in their organizations and how likely decisions made with the aid of the DSS are to be implemented.

The next set of analyses we conducted concerns the performance and the perceptions of these DSS users regarding the importance of various stages in DSS development. Figure 1 lists the 13 steps generally involved in the development life cycle of a typical DSS. Figure 2 illustrates the relationship between managerial end-user perception of performance vs. importance of these 13 steps in the development process.

Note in Figure 2 that the development life cycle steps of planning and evaluation received very low ranking in terms of performance, while being highly rated in importance. The complexities of distributed DSS will require very careful attention to these areas. The observations summarized in Figure 2 show that we seem to be much better in terms of

IN DEPTH

system design, demonstration and, especially, construction. In fact, DSS construction was the only step of the cycle where this sample of users rated performance greater than importance.

Despite the diversity of the sample used in the DSS end-user study, the sample is fairly small and the data impressionistic. Thus, the data presented in support of these ideas must be taken with a grain of salt. However, some interesting patterns that emerged from the study provide some indication of the user-related trends that may affect the development of new distributed DSS applications.

Corporate Micro Policy

An institution's attitude and policy on microcomputer acquisition and applications will have obvious impact on the speed and success of distributed DSS implementation. Several authors and consultants have pointed out the difficult balance between encouraging individual initiatives for effective, value-based, end-user developed systems on the one hand while achieving efficiencies of centralized standards and sharing of computerware and expertise on the

other.

Peter Keen and Tom Gambino of Micro Mainframe, Inc., Cambridge, Mass., have recently described some recommendations based upon their consulting work and extensive research. Keen will discuss this work further at an upcoming DSS conference (see box on In Depth/10).

Keen and Gambino suggest that a large enterprise — corporation, university, government agency — first create and fill the position of institutional micro coordinator (IMC). This person should have that proverbial rare blend of skills, experience and aptitude for management applications, along with adequate technical competence.

Under the leadership of this IMC, the organization should develop and support several "approved" micro hardware and software products. The hardware options should include at least a mainframe manufacturer line, a popular pioneer micro line, plus a CP/M machine (one of the new "hot boxes"). The ICM can then arrange purchase and service agreements through the leverage of volume, with better prices and responsiveness than are available to individuals at the local computer store. An on-

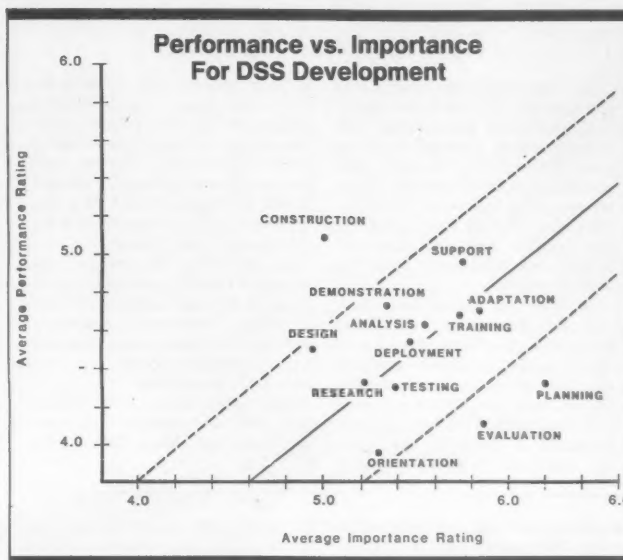


Figure 2

site inventory of spares and documentation provides further advantages of standardization.

Keen and Gambino further recommend the development and support of a spectrum of micro software, with in-house expert assistance on the designated products. The spectrum should include strictly localized DSS capability (Visicalc, DSS/F, DSS/A) and word processing, as well as packages to interface with larger files and DSS modeling languages.

The ICM should keep the broadest possible view of DSS and avoid focus on any one function or glamorous application. High-value payoffs more often come from timely, responsive service with simple tools, rather than from those elaborate efforts reported in the academic and professional literature.

Once these resources are in place, the ICM should provide an in-house applications consulting service. This would include user needs assessments, recommendations on hardware and software selection from the "approved lists" and referral to existing similar applications. The key aspect of all this is *advice but not consent*. Of course, by declining to support products not on the approved list, the ICM has significant influence.

An evolving critical role of the ICM will be to develop, maintain and monitor interfaces with the institution's central data resources. This function will increasingly involve satisfying auditors that smart terminals accessing and downloading sensitive corporate data will not violate the integrity of those records.

It is quite apparent that a different

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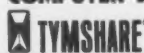


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Managerial Options

One way to gain an overview of the available DSS software products and share experiences with other users is through meetings and conferences. Several such meetings are held across the country each year, sponsored by the Society for Management Information Systems, the North American Society for Corporate Planning and other groups.

On Nov. 1-2, Boston-based Suffolk University, in cooperation with New York area chapters of the Planning Executives Institute and Investment Technology Association, will sponsor a conference on "Evaluating Decision Support Software" at the Grand Hyatt Hotel, New York. Keynoters Michael

S. Scott Morton and Peter G.W. Keen will discuss organizational impacts of DSS and future implications of microcomputer-based DSS, respectively. Morton and Keen are professors at MIT's Sloan School of Management and co-authored *Decision Support Systems: An Organizational Perspective*.

The upcoming conference will include a selected user/developer panel, as well as "software clinics" in which conference attendees will have an opportunity to speak directly with vendors. Ten systems will be reviewed.

More information is available from DSS Conference, 215 First St., Cambridge, Mass. 02142 (617) 547-5061.

attitude toward data security exists among DSS users than among the typical data processing professionals. The casual handling of floppy disks and portable microcomputer terminal emulators contrasts with the customary physical and administrative security and control at mainframe

DP centers. As the usefulness of distributed DSS attracts higher level users demanding immediate ad hoc access to highly sensitive data, this problem will loom large.

Several data processing managers have noted the relative lack of security for downloaded data and ana-

lyses they observe around the microcomputer workstations. A whole new dimension of concerns arises with criminal or vengeful motivations behind some of these new tools.

Conclusions and Concerns

Several forces have combined to accelerate the development of useful distributed decision support systems. Technical enhancement of microprocessors reduces the distinction between large and small computers: There will simply be larger or smaller boxes, all with "plenty" of computing power.

Coincident with hardware progress is the entrepreneurial surge of software, although there must eventually be some shakeout toward more integration and standardization. The distributed DSS marketplace will likely shift from the proliferation of individual hardware and software tools to the "systems house" full-service vendor — as has been the case for many DP applications. The growing body of prospective DSS end users will have less patience for shopping in an expanding "toolyard" and more likely will seek deliverable systems solutions.

Pushing these developments is the unmeasured potential end-user demand for future forms of DSS.

About the Authors

Warren G. Briggs is professor of management at the Suffolk University School of Management, Boston, where he teaches courses on business policy and computer information systems. He is also general chairman of the Nov. 1-2 conference "Evaluating Decision Support Software" at the New York Grand Hyatt Hotel.

Briggs has taught at Northeastern University, Bentley College and MIT's Sloan School of Management and has been a principal in the consulting firm Harbridge House, Inc., Boston.

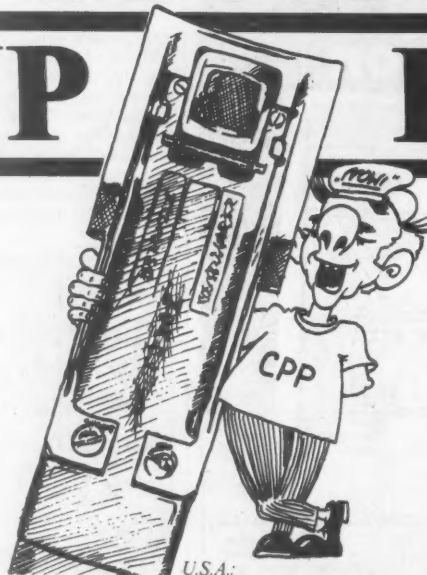
C. Lawrence Meador, a lecturer in the School of Engineering, MIT, and vice-president, Research and Planning, Inc., has taught, consulted and conducted research in the development of decision support systems in a variety of application areas. He is also program chairman of the upcoming DSS conference.

He was formerly assistant director of the MIT Center for Information Systems Research and was a founding member of the Clinical Decision Making Group at the MIT Laboratory for Computer Science.

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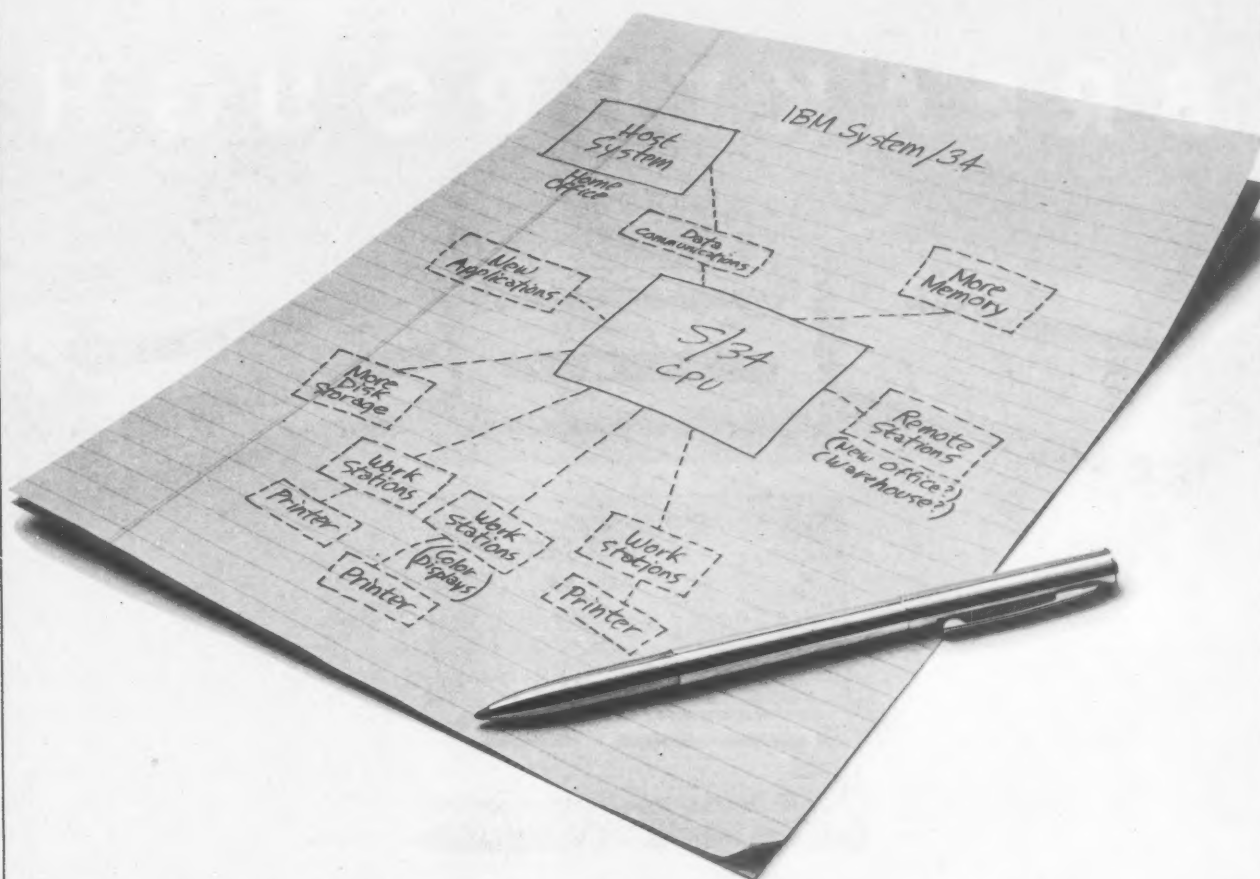
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BEFORE YOU BUY A DBMS ...

You don't have to buy an expensive, complex DBMS package to reap the benefits of data base technology. This article describes a least-cost alternative: how to design a relational model of the data base and translate it into a Vsam physical design.

By John M. DeLuca

Very often during the beginning stages of developing an on-line system, users hurry to decide which data base package to buy. Often they make the decision without having done a thorough analysis of the data involved in their business. Without the solid foundation of detailed data analysis, the data base management system (DBMS) package can become little more than an elaborate data access method.

As a result of jumping right in, users usually get bogged down in the technical details of the software package implementation and learning how to design and program for the new DBMS. They often spend huge amounts for specialists in that particular DBMS, training for the in-house technical personnel and, of course, the DBMS package itself. More important, perhaps, the extra effort concentrated on using the DBMS tends to delay project completion. Some of the DBMS packages are fairly complex, making effective communication difficult between the managers and operational users of the system and the system's designers.

The user might ask, "Don't we have to choose our DBMS early enough in



BEFORE BUYING A DBMS

In Depth/14

IN DEPTH

the project so we can actually use it in our system? After all, our firm is committed to a data base environment."

Actually, it is not necessary to buy an expensive DBMS package in order to get the

benefits of data base technology. Consider, for example, two of the primary benefits a DBMS package would offer:

1. It enforces centralized control over the definition and use of the basic elements

of information in the business and their interrelationships.

2. It tends to encourage the use of some form of detailed data analysis of the system as a prerequisite to using the

DBMS.

Users can enjoy those two major benefits plus others by adopting the data base methodology explained here, without purchasing a DBMS package.

Briefly, the methodology involves creating a relational conceptual (that is, logical) model of the data base and then translating that model into a Virtual Sequential Access Method (Vsam) physical design. This approach can be taken as either a permanent data base design solution or as an interim solution until a more comprehensive and automated DBMS package can be selected.

If the system is designed with a suitable data access interface, replacing the Vsam physical data base with some other DBMS later on becomes a fairly simple task. In that case, the user need only create a new interface program instead of rewriting each application program.

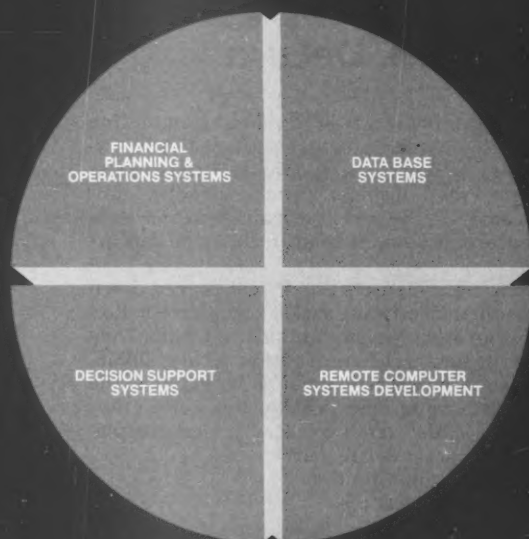
As the methodology is explained, it will become apparent that many of the advantages of a DBMS package can be achieved with very little of the costs and technical difficulties associated with a new DBMS. Some of the results in following this methodology include the following:

1. A relational conceptual model is created in "third normal form," where data redundancy and variable length relationships are eliminated.

2. The managerial end user gains a simplified view of the data. The entity-relationship diagram clearly expresses the data elements and their interrelationships as simple tables.

3. Although the conceptual data model is relational (to the end user the data is presented as tables), the programmer views the data as being laid out as hierarchical relationships. This will be explained later.

4. The relational model allows for data independence in that the addition of new



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data elements or new relationships (records and files) need have no effect on existing running programs.

5. A further degree of data independence can be achieved if the appropriate I/O interface is created. This will allow Vsam to be replaced by some DBMS in the future.

6. Vsam is easy to learn for both de-

Part II. Designing the Vsam data base.

Step 1. Designing Vsam keys and records (creating the key structure diagram).

Step 2. Review of on-line accessing using Vsam.

Part I. Creating the conceptual model.

Although this article is primarily concerned with data base analysis and design, a brief review of some of

the important steps in systems analysis are included, since the two functions go hand in hand.

Step 1. Data and process analysis of the current system. Before the conceptual model of the data base is developed, a complete analysis of the current system must be done. This step is very often neglected, perhaps because of the desire to implement the new system quickly. This analysis, however, will reveal a wealth of detail about the information current-

ly used in the enterprise as well as about the processes that transform this information.

I have observed several cases where the data model was created without this prior process analysis. The data analyst was then put in the position of strongly influencing the future processing capabilities of the new on-line system, instead of the systems process requirements determining the data base design. From a practical point of view, both data

'No purchased DBMS package can ever take the place of the fundamental data analysis and systems analysis that must be done for every system, especially a complex on-line, transaction-oriented system. If the analysis is not done properly, the DBMS package will not rescue you; in fact, it may make matters worse.'

sign and programming. Also, the expertise in Vsam is fairly well established in the industry.

7. The physical design described in this article is Vsam Key Sequenced Data Set (KSDS). This means that any record, that is, table occurrence or "tuple," in relational terminology, can be accessed directly. In addition, records having the same generic key data will tend to be located in the same control interval, allowing for faster data retrieval when processing related records.

8. Perhaps more important than all of the above is that the execution of the methodology serves as a step-by-step guide in the development of a highly structured data base and systems design.

I would like to say more about this last point: No purchased DBMS package can ever take the place of the fundamental data analysis and systems analysis that must be done for every system, especially a complex on-line, transaction-oriented system. If the analysis is not done properly, the DBMS package will not rescue you; in fact, it may make matters worse.

Management, ever in a hurry to get the application into production, is often tempted to either bypass or minimize the crucial analysis phase. Don't take shortcuts. Keep the faith! Remind yourself constantly that the methodology, if followed, will not only do the job right, but will eventually get you to the end result in the fastest possible time.

The following is a brief outline of the relational data base methodology to show the direction of this article.

Part I. Creating the conceptual model.

Step 1. Full analysis of the current system.

Step 2. Structured analysis of the new on-line system.

Step 3. Data dictionary update.

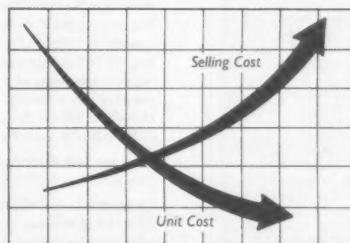
Step 4. Designing the data base in third normal form (creating the entity-relationship diagram).

Step 5. Selecting the appropriate relationships for on-line use.

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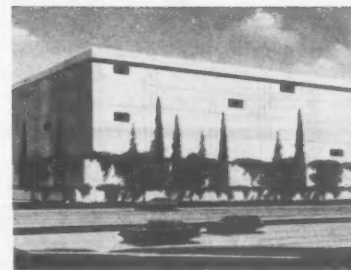
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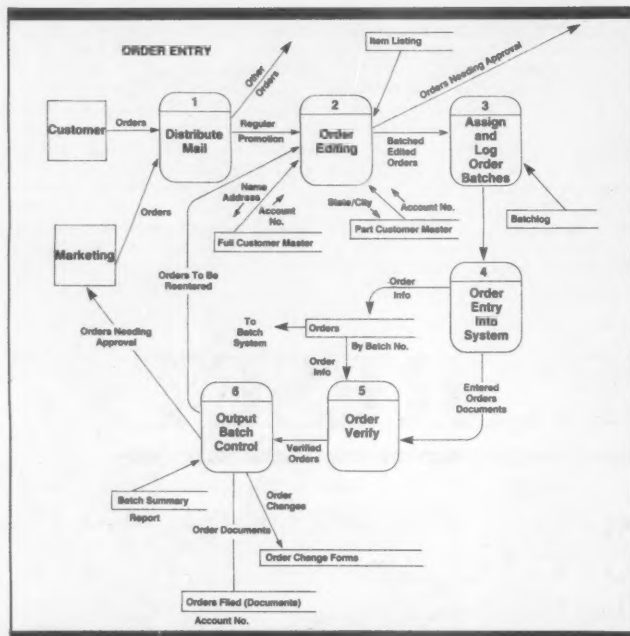


Figure 1. Current System

analysis and process analysis should be performed concurrently.

The technique that I have found very effective is commonly known as data flow analysis, which is widely accepted and used as the basis for structured analysis. It models the enterprise in terms of:

1. Sources and destinations of the information.
2. The various elements of information "flowing" between points where information is used or transformed.
3. Descriptions of the points (processes) where information is used or transformed.
4. Data stores which represent the storage of information throughout the enterprise.

Figure 1 shows how a data flow diagram (DFD) would be constructed. At this stage of analysis, it would be wise to identify all documents, reports, existing computer systems and so on. All of the data elements (units of information) should be identified and described fully, thereby forming the foundation of the data dictionary, which will become the major tool for any further data base analysis.

The diagram in Figure 1 will, of

course, need to be expanded with more detail about the information in the system.

Step 2. Data and process analysis of the new on-line system. After developing the functional requirements for the new on-line system, a data flow diagram of the proposed system should be developed. Here the analysis may require several levels of detail before a final DFD is completed. Figure 2 represents such a diagram at a rather high level of abstraction.

It is important to show all accesses to the data stores. Decisions can now be made as to which accesses to the data base will be on-line functions as compared with those accesses performed either manually using printed reports or as off-line functions that may include sorting of the data base.

The on-line access requirements will determine which relationships (record types) to use and how to segregate these relationships into different groupings (files).

The information represented in the DFD is still in very general terms. For example, "Batched Orders" represents those orders that are ready to be entered into the on-line system af-

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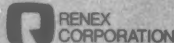
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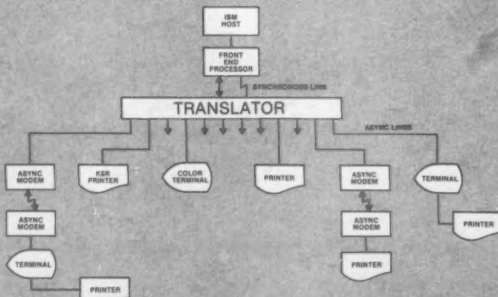
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ter having been edited and assigned a batch number. At this point, batched orders should be defined in terms of all the data elements that are associated with each other within the batch and with the batch itself.

It is important to determine and specify which data elements within each order make that particular order unique; that is, what is the key of each order. In this case, it is only the order number (ORDER-NO).

In addition to identifying each data element in an order, the analyst should also define the relationships between the data elements. For example, one order may include many items and may have only one optional alternate shipping address. These data elements and their relationships must eventually be represented in third normal form. The normalization process and the presentation in an entity relationship diagram (ERD) will lead us directly to our conceptual relational model. This step will be discussed in more detail later.

Step 3. Data dictionary update. Further elaboration of the data dictionary is required at this point. Developing appropriate standards for data element names can greatly simplify the programming effort as well as establish a better mechanism for communication between the technical staff and the managers and end users of the system.

Full names should be used instead of short ones. For example, planned-order-release-date is better than Plnd-Ord-Rel-Dt, which is a great deal better than PLORRDT. Remember that the programmer is not the only one making reference to the names of data elements.

In any data base, there will be a need for dates, codes, indicators, numbers, amounts, totals and so forth. These types of data elements should be consistently named throughout the data base (for example, DT, CD, IND, NO, AMT and TOT). A dictionary of allowed abbreviations can also be used. However, the end user or manager may not have access to the definitions during an important design meeting. Abbreviations that are too short may detract from the quality of the communication.

Analysis of the processes within the system will also result in new data elements being added to the data base.

Step 4. Normalizing the data base. The primary objective of the normalization process is to identify and select those relationships among the data elements which satisfy all of the on-line processing requirements of the system and meet the specific conditions discussed below. These relationships will eventually be designed as separate records in the Vsam data base.

Briefly, these relationships must have the following properties:

1. Each relationship must be unique in the system. The part of the relationship that makes it unique is called the key, which can be composed of

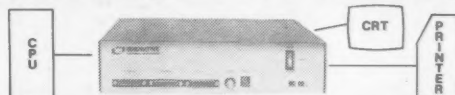
one or more data elements. Examples of relationships would include the following:

- The ORDER-NO has a one-to-one relationship to the customer number. (CUST-NO). For each order entered,

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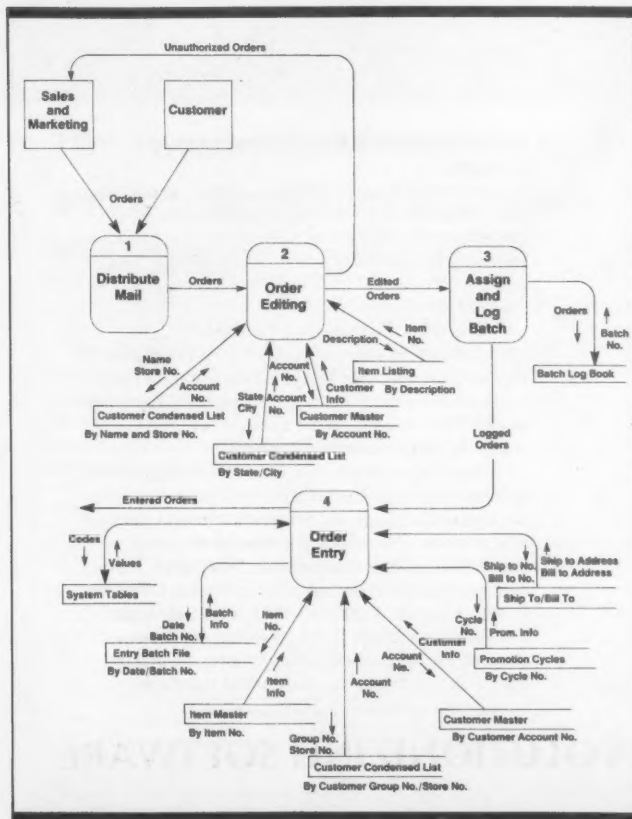


Figure 2. Proposed On-Line System

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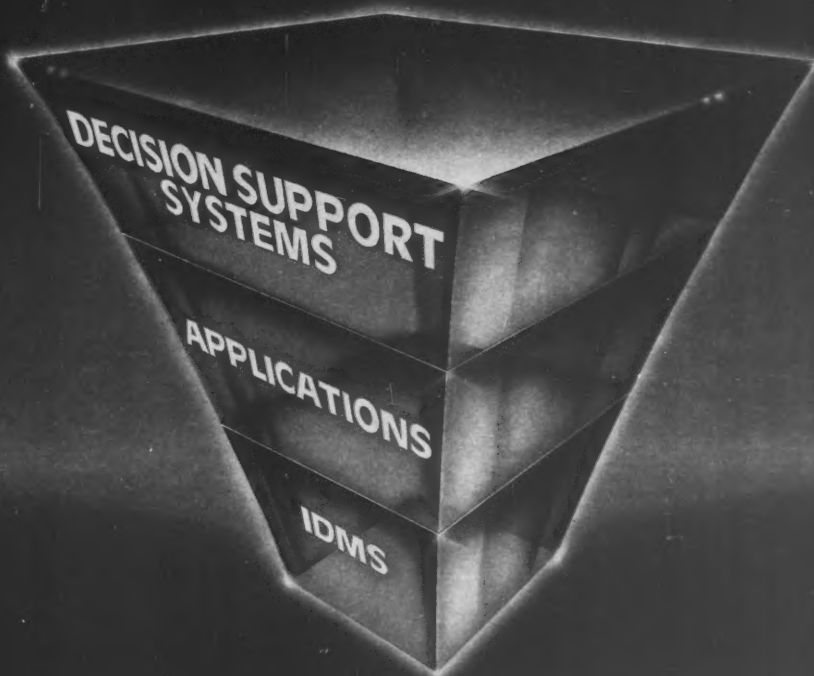
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there is only one customer associated with that order.

ORDER-NO -----> CUST-NO
1:1

In addition, the ORDER-NO has a one-to-one relationship with order data elements such as ORDER-ENTRY-DATE. All of these one-to-one relationships should be grouped into one record uniquely identified by ORDER-NO.

- The ORDER-NO has a one-to-many

relationship. On any order there may be more than one line-item where each line-item represents a request to obtain a specific item (product).

ORDER-NO -----> LINE-ITEM-SEQ-NO
1:M

Every line-item in the system can be uniquely identified by the specific ORDER-NO and LINE-ITEM-SEQ-NO. This combination of data elements constitutes the key of this relationship.

• The ORDER-NO may be updated with an order trace. Whenever a change to the order is made, it may be desirable to monitor this change by creating a new relationship in the data base for each update event. Each change made can be uniquely identified by the date and time of the change to the nearest second.

ORDER-NO -----> ORDER-TRACE-DATE +
ORDER-TRACE-TIME
1:M

Each order trace in the system can be

uniquely identified by the combination of: ORDER-NO + ORDER-TRACE-DATE + ORDER-TRACE-TIME.

2. There may be none or one or more other data elements which are called attributes of the key. These attributes must have the following characteristics:

- Each attribute must occur only once in the relationship. If the data element occurs more than once in a relationship, then a new relationship must be defined where each previously repeating data element is now incorporated into the key of the new relationship. It may be worth it to compromise on this rule for the sake of disk space conservation; for example, store 12 months of historical data on one record instead of creating 12 separate month records.

- Each attribute must be functionally dependent on the whole key. If not, then the attribute belongs in a different relationship. For example, you would not put the ORDER-RELEASE-DATE in each LINE-ITEM-SEQ-NO record since the ORDER-RELEASE-DATE does not depend on which items (products) are on order. Instead, it would go in the relationship record where there are all the other one-to-one relationships between the ORDER-NO and its attributes.

- No two attributes can be functionally dependent on each other. For example, the ITEM-DESCRIPTION should not be carried in the same record as the ITEM-NO since the ITEM-DESCRIPTION is dependent on the ITEM-NO.

In order to demonstrate these concepts in a more concrete way, let us look closely at those relationships having to do with orders entered into the system. One of the first steps is to construct a "first-cut" entity relationship diagram that shows the important relationships (see Figure 3).

The diagram shows that for each unique order, there are one or more line-items possible for this order and that for each line item on the order there can be one or more shipments, that is, ORDER-SHIP-DATE, and for each unique order there can be many order trace records. Only some of the dependent attributes are shown in this figure; however, all attributes must be shown in a complete entity-relationship diagram for each of the four relationships in Figure 3.

Step 5. Selecting the on-line relationships. One of the distinguishing features of an on-line transaction processing system is the need for rapid access to the information stored in the data base. Most on-line transactions that are used frequently will require response times ranging from one to three seconds in order to obtain sufficient operator productivity.

If the appropriate relationships are not stored in the data base, then long searches and sorting would have to be performed to retrieve the infor-

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mation to be processed. This extra searching for data would not only result in a long delay at the terminal submitting the transaction, but would be detrimental to the quick accessing of data by all other terminals. If many terminals were initiating long searches and sorts, it is possible that the on-line system would come to a standstill as a result of the long running transactions in the system interfering with each other's progress.

It is therefore important to identify those data access requirements for on-line usage only.

For example, to find out what line-items are present on a given order (unique ORDER-NO), the access path would then be by ORDER-NO:

ORDER-NO -----> LINE-ITEM-SEQ-NO
1:M

This relationship is then represented in the data base.

If one needs to know on-line the most current information as to which line-items on orders have a specific item (product) in them, we would need the relationship:

ITEM-NO -----> ORDER-NO
+ LINE-ITEM-SEQ-NO
1:M

To determine what orders a specific customer has placed, we would need the relationship:

CUST-NO -----> ORDER-NO
1:M

Each of these relationships would eventually be represented in the system as a record type in a Vsam data set (file). Once all of the selected relationships have been presented in entity-relationship diagrams, the conceptual model of the data base could then be considered complete. The entity-relationship diagram is an excellent tool for any further work to

be done on the system. End users and managers of the system can more easily understand the data elements involved and their interrelationships.

Part 2. Designing the Vsam data base.

In any DBMS there is a translation step that takes the DBMS from the conceptual model to the physical design of the data base. This methodology is no exception.

However, to translate the conceptual model as represented in entity-relationship diagrams into a Vsam KSDS file structure is very simple. The basic idea is to develop a unique key for each record (relationship) in the various groupings (files). For example, all relationships that begin with ORDER-NO can be grouped into one Vsam KSDS file called ORDERS (see Figure 4).

One important consideration using Vsam is that all record types in the file must have the same key length and location in each of the records in the file.

When accessing a specific record type for a given order, Vsam must have some means of determining which record type is being asked for aside from the actual data values of the data elements that comprise the key. Record type fields are needed to uniquely identify each record in the file. These record type fields within each record allow the file to be viewed as a hierarchical file where the ORDER-NO record can be considered the root (parent) while the record types such as LINE-ITEM-SEQ-NO and ORDER-TRACE-DATE/TIME are considered as dependent segments (children) of the root.

Important points about the key structure diagram are as follows:

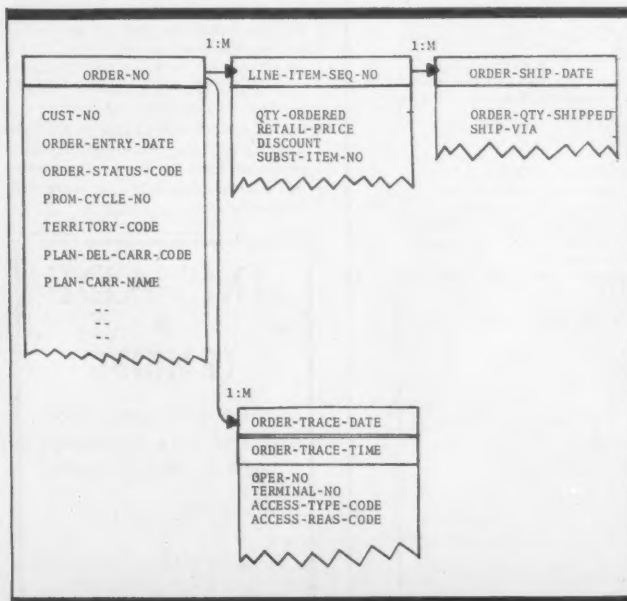


Figure 3. Entity Relationship Diagram

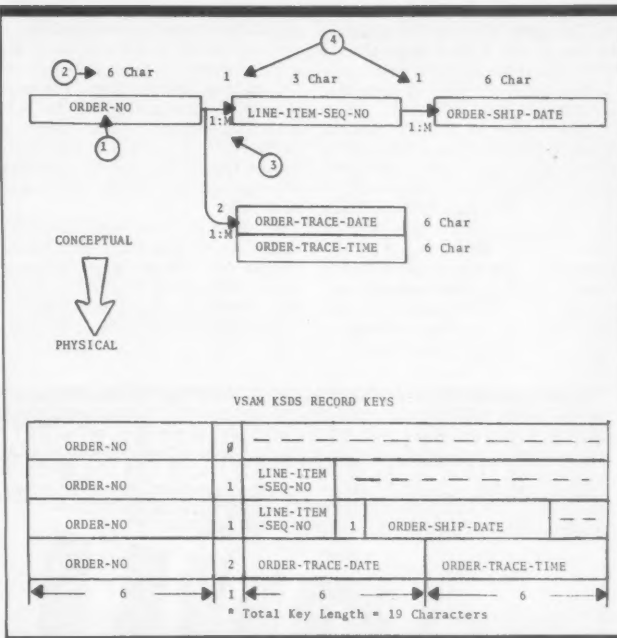


Figure 4. Key Structure Diagram

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1. The data elements that make up the key of the relationships should be identified by name.

2. The length in bytes of each data element should be indicated.

3. The degree of the relationship between the data elements should be shown, that is, 1:M (one-to-many) or 1:0/1 (one-to-none or one-to-one).

4. Each relationship that combines data elements for the key should have a record type included in the key between any two of the data elements in the key which are adjacent to each other. Trace date and trace time combined can be considered as

one data element for this purpose.

In the example shown, there are four relationship types that will result in four different keys. The keys should be calculated using the byte length of each of the data elements involved in the record key plus the record type fields. The longest key required will become the key length of the file.

For example, the ORDER-SHIP-DATE record has a key as follows: ORDER-NO (6 char.), REC-TYPE-1 (1 char.), LINE-ITEM-SEQ-NO (3 char.), REC-TYPE-2 (1 char.) and ORDER-SHIP-DATE (6 char.). Total: 17 characters.

acters.

Whereas, each trace record has a key of: ORDER-NO (6 char.), REC-TYPE-1 (1 char.), ORDER-TRACE-DATE (6 char.) and ORDER-TRACE-TIME (6 char.). Total: 19 characters.

The key of each record in the file must therefore be 19 characters in length. This duplication of information in the key only takes place in the data portion of the file in Vsam KSDS, while the index records that point to the data records are themselves compressed to eliminate any duplication of key data.

For very large data bases (many mil-

lions of records), this redundancy of key data would create the need for much more disk storage than perhaps some other DBMS. However, for small to medium data bases, the Vsam KSDS organization proposed here seems more than worth this trade-off.

Accessing the Data Base

At this point in the development of the Vsam data base, the decision has to be made as to whether or not the programs will be coded to access the Vsam files directly. In this case, the programs will have to be rewritten in the future if the data base is to be changed to other than Vsam. Instead, a more flexible approach is to specify operations against only the conceptual model in the programs and to write an interface module that will interpret the functional requests into physical operations against the Vsam files.

When it comes time to migrate to a different DBMS, only a new interface program would be required to interpret the same standard functional requests into the new DBMS physical data access requests. The functions that would be used against the data base are fairly standard regardless of the DBMS, although for Vsam there are certain peculiarities.

These functions include:

1. **Record addition.** When a record is added to the Vsam data set, the record is physically inserted in the data set in key sequence. Surrounding records are rearranged to allow the new record to be inserted.

2. **Record deletion.** When a record is deleted from a Vsam data set, the record is physically removed from the data set such that no trace of its existence remains.

3. **Record updates.** A direct read for update must be done on the Vsam record. Vsam searches an index file to determine where the record is located on the data set and retrieves that record for the program processing that record. This means that any record (relationship) can be accessed directly without chaining through a series of records. When the record has been modified, it is then rewritten for update.

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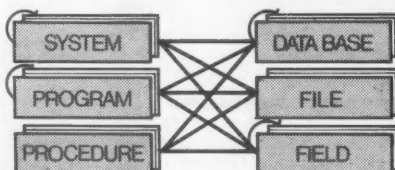
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4. *Record inquiry.* Vsam provides the ability to read records directly by specifying the full key or a partial (generic) key and also specifying an equal compare or a greater than or equal compare on the key search.

5. *Browse the file.* Very often it is necessary to read the file sequentially in order to view records from the data base using some data extracted from the records accessed. The browse operation in Vsam allows you to begin the sequential read at any point in the file — at the beginning, end or at any record whose full or generic key has been specified. The browse operation will be very efficient, since all of the records in key sequence will be located in physical proximity on the file, that is, in adjacent control intervals.

6. *Alternate path to file.* There will most likely be requirements to browse the files by some data element other than the primary (left-most) parts of the key of a file. In this case, an alternate path into the file is needed. This can be accomplished by establishing an alternate index where Vsam will automatically maintain the index. However, for the sake of flexibility in going to another DBMS, it may be desirable to establish and maintain your own alternate index (cross-reference) file.

Since a data element may occur in more than one record in the data base, it is the responsibility of the programs to maintain the integrity of the data base. For example, when adding an order to the file, a new relationship between CUST-NO and ORDER-NO must be created in the customer file, assuming, of course, that the relationship is desired in the first place.

These data access functions can be parameterized in the application programs as if the operations were performed against the conceptual model.

Methodology Advantages

Some of the advantages in implementing this methodology are as follows:

- **Better communication.** More effective communication is established between the user and development groups as a result of using the entity-relationship diagrams and the data dictionary. The graphical presentation of the data and the interrelationships greatly increases understanding of the data and consequently of the system by both DP and non-DP people.

- **Flexible record design.** Vsam KSDS files allow for variable length records with a maximum key length of 256 characters. This makes it easy to form relationships whose keys are composed of more than one data element and to group these different length relationships (records) into one file (data set).

- **Easily maintained data base.** This means that the data base can change radically as a result of adding or deleting relationships without affect-

ing current working programs that use the data base. Whether programs are accessing records directly (a unique record access) or through browsing, the additions or deletions of any "unreferenced" records within the data base are "invisible" to those programs. This is because Vsam KSDS can directly access any record (relationship) individually and is therefore not concerned with the presence or absence of any other records.

Since the records can always be retrieved sequentially in ascending or descending key sequence, all programs could easily be coded to ignore unwanted records. If any two relationships are conceptually independent, they are also physically independent from an access point of view.

- **Flexible record grouping.** The use of record type fields within the key of the record provides flexibility in the way the records (relationships) are grouped in the file. Figure 5 shows how all occurrences of each record type can be grouped together by positioning the RECORD-TYPE in front of the key. Alternately, all record types for a given ORDER-NO are grouped together by positioning the RECORD-TYPE after the ORDER-NO and between successive data elements of the key.

The latter option allows the records for a given order to be laid out hierarchically. If the on-line access requirements are such that many records for a given order are needed, as in a browse operation, then the hierarchical layout is preferred.

If processing is to be done on only one record type, then the first option might be considered. Since most on-

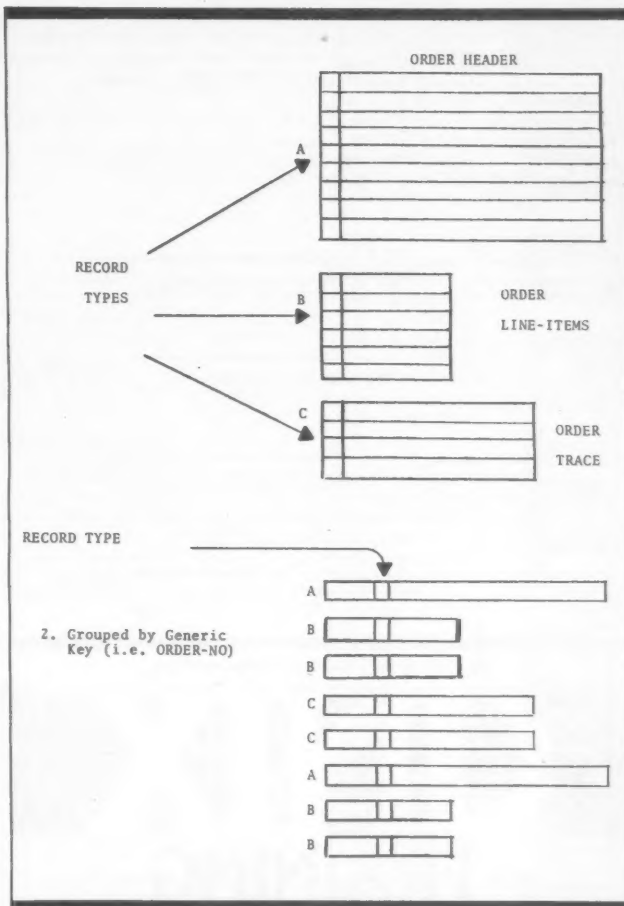


Figure 5. File Record Groupings

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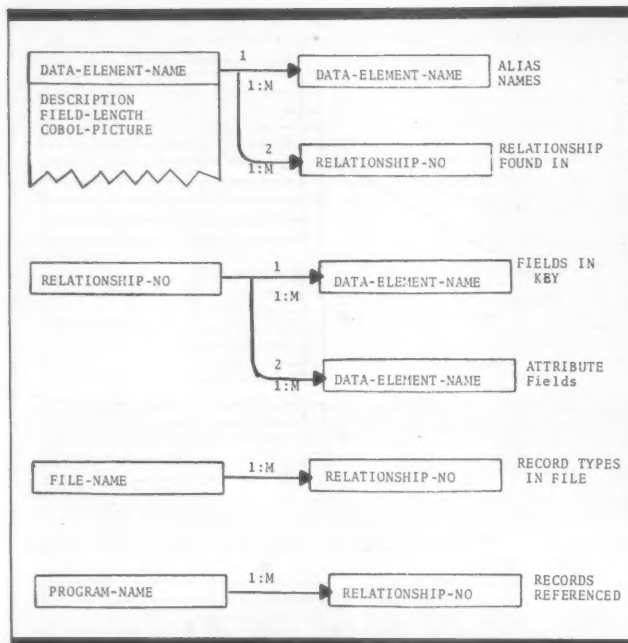


Figure 6. Data Dictionary Relationships

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line sequential processing requires accessing many records for a given ORDER, CUSTOMER, ITEM and so on, the hierarchical layout is best for the following reasons:

1. Less data access (less I/O) is required when browsing the file since these records will be physically next to each other.

2. The logical structure of the programs is simpler (more hierarchical) if the records themselves are presented in hierarchical sequence.

When direct accesses are involved, the organization of records within the files is not as important since different files are usually involved in any one transaction.

Now that you have read about the methodology and see the importance of the data dictionary function, you might conclude that a data dictionary package is the immediate answer to your data base development problems. However, before investing in an expensive software package that might not be the best product for facilitating your on-line systems development effort, you might consider performing some data analysis for the data dictionary requirements first. This primarily involves determining what information should be kept in the data dictionary.

Performing this initial data analysis implies that a better understanding will be achieved of what data is to be gathered about the business information itself — in other words, what data should be kept in the data dictionary. This knowledge will eventually help in the selection of the appropriate data dictionary package.

In addition, the information could be gathered and recorded manually prior to the data dictionary installation, thus saving valuable time in the data base development. Figure 6 shows what kinds of details about the information in the system would be valuable in the data dictionary.

The data base commitment involves, at the least, a commitment to a complete understanding and control of the information used in running the business. In order to attain

the desired control, procedures for collecting and recording the information must be put into effect. Having a data dictionary package makes the job a lot easier, but does not guarantee success unless used properly for its primary purpose. This means using it as a tool to assist in the data base analysis.

The gathering of data dictionary data will also serve as a good foundation for the future. As data dictionary packages improve, the scope of their functions will also increase. In addition to being a repository of data about data, the dictionary will help to generate and maintain the application software that uses the data.

I have tried to present an approach to on-line systems development that focuses on the importance of data analysis and the creation of a real physical data base from the conceptual data base model.

Ultimately it may be less costly and faster to develop support software that could enhance the effectiveness of this approach than it would be to implement a new DBMS. This, however, may be true only for those organizations that have a strong software talent already available.

As a final reminder, I would emphasize that buying a DBMS is not going to eliminate the need for data base analysis. However, once the analysis is done, a DBMS will be much easier to implement.

About the Author

John M. DeLuca has been involved in data processing since 1966. Initially he was a systems engineer with IBM for five years. For the past eight years, he has been a New York-based independent consultant specializing in the design and development of on-line systems primarily using CICS/VS and CICS/DMS/VS.

DeLuca also has extensive experience as an instructor in these areas. He owns his own software consulting firm, Software Performance & Education, Inc., and will soon begin writing a text in CICS/VS for command-level programming.

He holds a B.S. in physics from Brooklyn College.

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GTE, Tymnet Deregulation FCC Foreign Trade Decision Draws Fire

By Phil Hirsch

CW Washington Bureau
WASHINGTON, D.C. — "The decision is virtually certain to end up in court; no one outside the FCC [Federal Communications Commission] favors it, and there are several staff members within the commission who believe it was a mistake."

That's what one knowledgeable source said recently when asked about an FCC ruling in August that allows GTE Telenet Communications Corp. and Tymnet, Inc. to offer enhanced, computer-based communications services overseas free of regulation. Users who lease international communications channels reportedly fear that

foreign communications administrations will respond by raising their rates and/or imposing usage restrictions.

Specifically, the FCC ruled that its Second Computer Inquiry Decision (Computer II),

Analysis

promulgated at the end of 1980, applied to international as well as domestic services. As a result,

beginning next January GTE Telenet, Tymnet and other U.S. international carriers can offer enhanced services on a deregulated basis.

What bothers the foreign reg-
(Continued on Page 72)

AT&T Submits Plan to Split Service Territories

WASHINGTON, D.C. — AT&T's nationwide service territory would be carved into 161 Local Access and Transport Areas (Lata) under a plan the phone company submitted here recently to Federal District Court Judge Harold Greene. The plan would take effect after divestiture of 22 Bell operating

companies, now tentatively scheduled for January 1984.

Service within each Lata would be provided by a Bell operating company. Service between Latas would be provided by AT&T Long Lines Division or its competitors, such as MCI Communications Corp.

The rates to be charged by

each Bell operating company will depend to a large extent on the size and composition of its customer base, so the Lata filing is likely to be examined closely by state regulatory bodies and independent telephone companies. Firms that operate private communications networks are also likely to be affected, since the Lata boundaries will help determine how much the operating companies charge for access to their local-exchange facilities.

Interested parties have 30 days to comment on the Lata plan. Afterward, the phone company and Justice Department have 20 days to respond to these comments. The plan will then go to Greene, who has the final word.

Bell Enhances Its Dimension PBX

NEW YORK — The Bell system has announced four enhancements for its Dimension private branch exchange (PBX) product line.

The first is an off-premise Energy Communications Service (ECS) that is said to allow multi-location organizations such as bank branches and industrial parks to control and reduce energy consumption economically in their remote buildings. The service reportedly allows for central control of up to 64 individual energy-consuming devices at each of up to 14 remote locations.

The other three enhancements are:

- Call Detail Recording and Reporting, a communications cost accounting system to collect and process station message data.

- Terminal Change Management, a customer-operated PBX station reconfiguration system to control calling privileges.

- Facilities Management, a system to define and assign routing patterns that allow us-

ers to fine tune their network facilities.

A typical ECS configuration is available for \$1,860/mo with an installation charge of \$14,400. A typical Call Detail Recording and Reporting enhancement costs \$5,600/mo with an installation fee of \$6,021; a typical

Terminal Change Management enhancement costs \$300/mo and \$370 for installation; and a typical Facilities Management enhancement costs \$400/mo with a \$420 installation fee.

More information is available from AT&T, 195 Broadway, New York, N.Y. 10007.

Digi-Touch Announced

Firm Unveils First in PABX Series

SAN JOSE, Calif. — Anderson Jacobson, Inc. (AJ) has unveiled a digital private automatic branch exchange (PABX) with voice and data capabilities and 100% electronic teletests, visual display attendant consoles and switching system.

AJ said the IOX-1000 will be the first in a series of third-generation voice/data PABXs.

With AJ's Digi-Touch teletests cable-connected to the firm's AJ 520 CRT terminal and AJ 650 ink jet printer terminal, both voice and data move through the switch to individual work-

stations.

Two methods of data handling have been shown. In the attended mode, the user touch-dials another station, the recipient answers and prepares to receive data by making sure equipment is on and ready to receive. In the unattended mode, the user touch-dials the station, then touches the Data key and begins transmission.

When completed, the user touches the Data key again to restore voice transmission.

The PABX supports both asynchronous and synchronous data

communications at all standard rates from 110- to 19.2K bit/sec.

The IOX-1000 digital switch is a multiprocessor-based computer that controls all other system elements. It consists of card cages containing line and trunk interface printed-circuit boards, providing approximately 800 user ports, switching and signaling circuitry, controller and memory and power supply.

The IOX-1000 costs approximately \$1,100 per station, Anderson Jacobson, Inc. said from 521 Charcot Ave., San Jose, Calif. 95131.

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The 330E Dataplexer provides fallback speeds of 7,200, 4,800 and 2,400 bit/sec and provision is made for direct-distance dialing backup if the dedicated four-wire line channel fails. An aggregate input rate of 153.6K bit/sec reportedly allows the 330E to support 16 9,600 bit/sec or 32 4,800 bit/sec channels.

The 8-channel 330E is available for \$4,800 from Tellabs, Inc., which is located at 4951 Indiana Ave., Lisle, Ill. 60532.

DLM III Monitor Gets Price Cut

MONTGOMERYVILLE, Pa. — Digilog Network Control Division has announced price reductions for its data line monitor. Formerly priced at \$3,775, the DLM III is now priced at \$2,995.

The interactive line monitor features speeds up to 19.2K bit/sec. It also offers 8K bytes of data storage, bit/byte protocols, programmable trap, interactive modem and terminal simulations and EIA RS-232C breakout.

More information about the DLM III is available from Digilog Network Control Division, 1370 Welsh Road, Montgomeryville, Pa. 18936.

Unregulated Foreign Service By GTE, Tymnet Draws Fire

(Continued from Page 71)

ulatory commissions — usually referred to as the postal, telephone and telegraph (PTT) administrations — is that the ruling will encourage U. S. multinational companies to become resale carriers in fact if not in name. Presumably, beginning in January, any firm that leases international transmission facilities and has excess capacity will be free to resell that capacity to others.

While this would save money for the customers, it would reduce the carriers' revenues.

However, the PTTs would be free to refuse interconnection with any U.S. carrier or telecommunications user

which tried to share or resell leased international transmission facilities. Moreover, the U.S. carriers have tariff restrictions that bar resale or sharing of their leased circuits.

What really bothers the foreign administrations is that the FCC acted on its own, without submitting its proposed policy to the Consultative Committee on International Telephony and Telegraphy (CCITT), a consortium of the free world's telecommunications administrations. This is not the first time the FCC has thumbed its nose at the other members of CCITT, as the PTTs see it, and if past history is any guide, they will not hesitate to retaliate.

Risk of Retaliation

The risk of retaliation is not diminished even if, as seems probable, the FCC decision does not result in sharing of leased international circuits. There is also widespread unhappiness about the commission's decision to expand its Computer II decision — by allowing enhanced international services to be offered on a deregulated basis — without CCITT's prior blessing, as Western Union International, Inc. (WUI) pointed out a few weeks ago, when it petitioned for reconsideration of the FCC ruling:

"The adverse consequences of the extension of Computer II internationally are of cosmic proportions... The commission cannot regulate... international services as it does... interstate services... It must accord... deference to the views and policies of the rest of the world." One such policy precludes "resale of telecommunications services irrespective of whether [they] are unilaterally defined as enhanced or basic by the FCC."

Retaliation by foreign administrations has already surfaced, WUI added, referring to recent PTT proposals to replace flat-rate private line services with usage-sensitive public-switched offerings that would cost the user much more and limit his ability to customize the transmission facility. Attached to the company's petition were copies of telex messages from 12 foreign administrations objecting to the commission's decision.

The West German statement was particularly interesting: There is no CCITT recommendation "explaining the difference between basic and enhanced services," the Germans said. "It seems evident that with such a unilateral decision on the character of international services, FCC and therefore U.S. are moving outside the scope of CCITT recommendations. This is why we feel free to take any measures to protect our own national interests, whether those reactions are covered by CCITT recommendations or not."

Another outcome of the FCC decision, said WUI and other petitioners, is that it will encourage foreign carriers to form U.S. affiliates or exclusive relationships with existing U.S. domestic carriers. That will reduce communications competition within the U.S., thus frustrating the major objective of the commission's Computer II decision.

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FCC Puts Bell's TDC Tariff on Hold Until Oct. 29

WASHINGTON, D.C. — AT&T's Terrestrial Digital Circuits (TDC) tariff, which was scheduled to become effective Sept. 28, was deferred until Oct. 29 at the Federal Communications Commission's request. The commis-

Touch Input Introduced For VT100s

CHAMPAIGN, Ill. — Carroll Touch Technology, Inc. has introduced an infrared touch input system for the Digital Equipment Corp. VT100 terminal. The system can be used for diagnostic routines and downloadable formats.

Infrared light-emitting diodes are mounted on the side and bottom of a "window frame" composed of printed-circuit cards. Phototransistor detectors are mounted opposite the emitters to form an X-Y grid of infrared light beams. The beams are not visible to the user, yet each point where an X and Y beam intersect is a touch point.

The system is available for \$1,595 from Carroll Touch Technology, 2902 Farber Drive, Champaign, Ill. 61821.

Tau-Tron Offers Multiplexer

CHELMSFORD, Mass. — Tau-Tron, Inc. has introduced a multiplexer said to allow voice-frequency telephone, data circuits and audio program channels to be inserted or dropped from existing digital transmission facilities or channels to be originated and terminated.

The T1 Rate Digital Multiplexer, TDM-150, mounts in a standard 19-in. rack.

With front and rear access, dc or ac power supply and plug-in channel cards, the TDM-150 is available for \$1,650 to \$2,290 from Tau-Tron, Inc., 27 Industrial Ave., Chelmsford, Mass. 01824.

Nabu Adds Graphics Board

ROCHESTER, N.Y. — Nabu Commercial Terminals (formerly Volker-Craig) has added a graphics board for two of its graphics terminals.

The plotting resolution for the 3100/GX and the 4404/GX terminals is 512 by 150 with automatic scaling. A graphics cursor is provided for interactive use with the host computer.

The graphics board is available for field upgrade or factory installation. It costs \$1,000 from Nabu, 333 Metro Park, Rochester, N.Y. 14623.

sion staff needs more time to "review the complex issues raised by the filing," a spokesman said.

Many of those issues have been raised by the U.S. Department of Defense, Satellite Business Systems, Southern Pacific Communications Co. (SPCC) and the Independent Data Communications Manufacturers Association, a modem manufacturers' trade group. All of

them say the proposed TDC service is anticompetitive and overpriced. Among other objections, the critics allege that TDC rates would earn AT&T more than its authorized rate of return.

In addition, the phone company was taken to task for insisting that the TDC network interface, officially referred to as "network channel terminating equipment" (NCTE), must be obtained

only from AT&T if the customer is another common carrier. Telephone company customers, however, are allowed to provide their own NCTEs, according to SPCC.

The phone company's answer, basically, is that its proposed rates are cost-based; the lower per-mile charges for long-haul TDC service, as compared with short-haul, are allegedly due to recent technological advances, not

predatory intent. The NCTE is a "critical element of the network," AT&T added, and the company cannot "remain fully responsible for its circuits and services" unless it supplies this element.

TDC would replace AT&T's present 1.544M bit/sec Data-telephone Digital Service tariff. American Bell, Inc., the phone company's recently formed subsidiary, is expected to be a major customer.

Breakthrough in productivity: new Auto Dial and Log On modem.

You don't need a telephone to transmit data over dial-up lines the new NEC way. Just turn on the terminal, enter a two or three digit code, and hit the return key. That's all there is to it. The NEC 300/1200 Auto Dial and Log On data modem does the rest.

If a line is busy, the modem may keep on dialing that number—or a pre-programmed sequence of alternate numbers—until it receives an answer. The modem then automatically sends the log-on message. This user-friendly modem tells you via a terminal print-out or display exactly what's taking place.

Sound simple? It is. Even tem-

porary help can transmit data with a minimum of instruction and a maximum of efficiency. No time wasted hunting misplaced phone numbers, redialing busy lines or typing the wrong log-on message. Since phones aren't needed, unauthorized calls are eliminated. Let's the user concentrate on sending data.

Set a new standard of efficiency with NEC's new Auto Dial and Log On modem. Mail the coupon for more details, or call (408) 980-1500.

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Stat Mux Handles 16 Channels

SAN JOSE, Calif. — Halcyon Communications, Inc. has introduced a low-end statistical multiplexer that is said to concentrate up to 16 channels over a single phone link.

The 4001 is installed and

managed by entering requests through the built-in keypad while reading the response on the front panel display. It also features user-selected channel priority that allows for priority assignment on an individual

channel basis.

In-band and out-of-band flow controls are independently selected at each end of the channel for traffic balancing throughout a point-to-point network. Speed selection ranges from 50 to 9,600 bit/sec.

Pricing begins at \$1,690 for the four-channel version. More information is available from Halcyon Communications, Inc., 2121 Zanker Road, San Jose, Calif. 95131.

Banks Get Display System

NEW YORK — Arbat Systems, Inc. has introduced a terminal display system designed to provide banks' trading rooms with access to multiple external financial information and news services as well as connecting with internal real-time computer systems.

Marketed in North America by agreement with Reuters Ltd., which developed the terminal, the equipment can interface with the Associated Press, Dow Jones & Co. and Reuters' own information services. In addition, the system can interface with the Arbat Banking System now installed in many of the world's international banks.

Design Interface Accesses DTMF

OAKLAND, Calif. — A board-level design interface unit said to provide standard bus users with direct dual-tone multifrequency (DTMF) access to all functions of any standard bus system for control or diagnostics has been announced by Conway Engineering, Inc.

The CE4000-2 originates and answers calls, accepts send and receive DTMF signal codes and releases the line under program control, the company said. The unit comes with Conway's 2716 demonstration program and a modular phone jack.

The CE4000-2 costs \$399 from Conway, 675 Hegenberger Road, Oakland, Calif. 94621.

The terminal system is available for \$5,000 from Arbat Systems, Arbat Plaza, Hoboken, N.J. 07030.

"I don't think any other computer could have grown with us the way our Datapoint has."

Riley Jackson
V.P., Information Systems
First Interstate Bank of Washington,
Seattle



First Interstate Bank's computer was the right size when they bought it, and stayed the right size as the company's data processing needs grew. That's because they bought Datapoint's expandable computer system, the ARC™ local network.

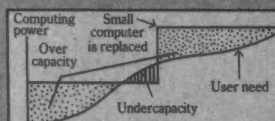
The ARC is expandable in a way no other computer is. You can actually increase its computing power. So, when First Interstate wanted their computer to do more work for more people, they just plugged in more Datapoint processors, storage disks, terminals, and printers. The ARC wasn't slowed by the added work because they were adding computing power with each expansion.

"So far we've expanded our administrative computer system from 30 users to more than 100," Jackson says. "The expansion steps are so simple that I really don't pay much attention any more. If somebody has a cost-justifiable job he wants to do with the ARC, we just plug in the new equipment he needs and he's on the system. The other users are unaffected."

"Compare that to the huge effort that usually goes into upgrading a company's computer. Upgrading the ARC is simpler than buying a company car."

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With the ARC, your company is spared the trauma of outgrowing its computer and starting over with a bigger one. And because the ARC system is expandable, you can keep all your people on one system. You're never forced to keep



To grow with ordinary computers, you throw out a little one and bring in a bigger one. You almost always have too much computer or too little.

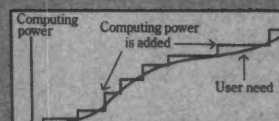
duplicate files in several computers.

Some other companies call their computers "expandable." But check to see what that really means. For some, "expandable" means there's a bigger computer in the product line so you'll have something to move up to when you outgrow the first one. For others, it means you can add more memory. For still others, it means you can connect several computers together in a network. But can those "expandable" systems grow in processing power? ARC can.

The most widely used local network

Datapoint pioneered the concept of local networks when the ARC was introduced more than five years ago. Now there are more than 4,000 ARC systems in use, far more than any competitive system, and an experienced service organization supports them worldwide.

Datapoint computer systems, including the ARC, will work with Datapoint word processing, electronic



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message, and telephone systems. You can assemble a single, comprehensive information system and that system will be expandable, too.

For more about Datapoint, call (800) 531-5639. In Texas, call (800) 292-5099. Telex: 767300 in the U.S.; 06986622 in Canada; or 923494 in Europe. Or write Datapoint Corporation, Corporate Communications T41CW, 9725 Datapoint Drive, San Antonio, Texas 78284.



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Uses 2780/3780 Protocol

Ascii Terminals, IBM CPUs Linked

MIAMI — Coastal Data Products, Inc. has introduced a microprocessor-based communications processor that is said to link a variety of Ascii terminals to any IBM or other computer system that supports the IBM 2780/3780 synchronous protocol.

The Model 3000 network adapter allows the user to interface multiple asynchronous devices of different

types, such as bar-code readers, printers and other I/O devices. Up to 32 terminals can be supported on a single synchronous communications line. Attached terminals may be either local or remote, a vendor spokesman said.

The adaptor can also be used for interfacing different types of asynchronous devices to non-IBM main-

frames, using other standard communications protocols for NCR Corp., Burroughs Corp., Honeywell, Inc. and Sperry Univac.

Prices range from \$4,400 for a four-line configuration to \$8,600 for a unit with 32 communications lines. More information is available from Coastal Data Products, 7370 N.W. 36 Ave., Miami, Fla. 33147.

Anaconda-Ericsson Offers Enhanced PABX

GARDEN GROVE, Calif. — Anaconda-Ericsson Information Systems has redesigned its ASB100 private branch exchange (PABX) to improve existing features and add capabilities in a more compact and modular package.

Key modifications to the system are the addition of 20 lines to the capacity, which is now 128, station message detail recording, trunk queu-

ing, line load control and three-party conference capability, the company said.

All features can be programmed either at the console or via a terminal, while the system monitors any changes made during the course of the call, such as conferencing or transferring.

More information can be obtained from Anaconda-Ericsson Information Systems, 7465 Lampson Ave., Garden Grove, Calif. 92641.

Bus Driver Fits DEC VAX, PDP

CHATSWORTH, Calif. — Micom Systems, Inc. has introduced a bus driver that it said allows users of the Digital Equipment Corp. VAX-11 and PDP-11 minicomputers to support both remote and local terminals with the same multiplexer with up to four times the number of terminals.

The Series 11 bus driver is an integrated asynchronous terminal interface that requires no changes to DEC-supplied hardware or software, Micom said. It provides transmission speeds for local terminals at up to 19.2K bit/sec and supports up to 16 RS-232C interfaces.

The price of the Series 11 begins at \$5,950. Micom is at 20151 Nordhoff St., Chatsworth, Calif. 91311.

Simulator Plans For Local Nets

STERLING HEIGHTS, Mich. — D.L. Hiller & Associates is offering a communications simulator to plan system load and throughput for local-area networks using the Commodore, Inc. 8032.

Current and planned networks for various vendor offerings under differing conditions can be simulated.

The Planning Local-Area Networks Through Simulation costs \$2,495 from Hiller, 14536 Island Drive, Sterling Heights, Mich. 48078.

AUTOMATIC REPORT WRITER: IBM/34

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The DN600, latest in Apollo's rapidly growing family of nodes for engineering, scientific, and CAD/CAM users, provides performance and flexibility unavailable in any other computer graphics system. The DN600 uniquely integrates a high performance superminicomputer with a full color graphics system, eliminating the performance bottlenecks associated with traditional processors and stand alone graphics terminals.

Like all Apollo nodes, the DN600 has a 32-bit central processor, 16 million bytes of virtual address space and support for up to 3.5 million bytes of main memory. In addition, the new color node has up to 2 million bytes of dedicated display memory, more than the total capacity of many other computer systems. Display memory can be used to store fonts, graphic templates, parts of oversized images, or the next image in an animated sequence. The DN600 provides 320 million-bit-per second area fills, so the entire screen can be changed in about 1/30 of a second.

The DN600's 19-inch, high resolution display offers a selection of more than 16 million colors and lets users select from seven interactive and imaging modes. Users can choose from a combination of 1024 x 1024 and 512 x 512 pixel resolution and 4, 8, or 24 planes for different levels of color selection.

The DN600 is ideal for applications such as computer-aided design, where high resolution and fast response times are essential; and for solids modeling and imaging, where users build high quality graphics with many colors and subtle shading.

The DN600 is fully software compatible with Apollo's monochromatic DN400 or DN420 nodes, and can be added to any existing Domain network.

And the new DN600 node costs under \$60,000, far less than the price of any other 32-bit computer with comparable color graphics capability.

NEW DISTRIBUTED DATA MANAGEMENT SYSTEM TAILORED TO THE NEEDS OF ENGINEERING AND SCIENTIFIC PROFESSIONALS.

Apollo's new Domain Distributed Data Management System (D3M) is the first truly distributed database management system available from any computer manufacturer. It combines the efficiency and performance of a CODASYL-compliant DBMS with the flexibility of a relational interface. Its applications range from a personal electronic file cabinet to a full mainframe-level, shared database.

D3M works exactly the way engineering and scientific users work, allowing members of a design team to create and update a database to store their own information. It's much easier to use than traditional "top-down" systems with predefined structures and centralized approaches. And with D3M, users can access each other's databases or combine them into a larger total data resource accessible to other groups, such as manufacturing and marketing.

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The high-productivity Domain programming environment includes ANSI-standard FORTRAN 77, Pascal, and C; a wide range of standardized software tools; and a highly consistent, yet flexible command environment. A SIGGRAPH CORE graphics package and a comprehensive set of graphics primitives help speed application development. Apollo's IBM 3270 and HASP emulators provide communications with central computer systems.

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A growing library of third-party software provides support for scientific, engineering, modeling, CAD/CAE, and decision support applications. The library includes packages such as MSC/NASTRAN and ANSYS, two comprehensive and highly regarded finite element analysis programs; PATRAN-G, a powerful interactive finite element pre- and post-processor; SCRIBE, a versatile and easy-to-use text formatting and document production system; and DISSPLA and TELL-A-GRAF, the leading data representation graphics software packages.

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The Concept of Domain Processing

The Apollo Domain distributed processing system is unique in its ability to combine a powerful, mainframe-like architecture, high resolution bit map graphics, and a high performance local area network. The Domain processing system consists of a collection of low-cost 32-bit workstations, each capable of running very large and complex applications. All workstations share a common network-wide virtual memory operating system that allows users to share resources—data, programs, files, and peripherals—transparently, across the network.

apollo
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Terminal-Controlled Unit Features Autodialing

SUNNYVALE, Calif. — A terminal-controlled modem that reportedly features autodialing, menu-controlled options and operation, complete keyboard control of modem functions and diagnostics and a non-volatile memory has been announced by Prentice Corp.

The 212 TCM was designed for remote terminal applications and adds intelligence to dumb terminals while eliminating the need for a phone as numbers can be dialed from the keyboard or from modem memory, the company claimed.

The modem also supports tandem dialing so that non-Bell Laboratories networks can be used, the vendor said. It also has alternate number dialing and number retry features, while its autospeed detection of ter-

minal speed eliminates the need for a manual speed setting.

The 212 TCM is priced at \$795 from Prentice Corp., 266 Caspian Drive, Sunnyvale, Calif. 94086.

Device Drivers Let Users Establish Multinode Link

RIDGEFIELD, Conn. — Kidde Automated Systems, Inc. has introduced two device drivers that are said to allow users to establish interprocessor communications between multiple nodes of all peer contention local-area networks by using ordinary call functions.

The RS-11 supports Digital Equipment Corp. Q-bus-compatible and DEC Unibus-compatible 1M bit/sec processor-to-processor networks and

the vendor's Megalink network. The RSX-11M driver is compatible with Intel Corp. Multibus operations, permitting mixed networks of Q-bus, Unibus and Multibus processors.

The RSX-11M is available for \$2,500. The RT-11 is available for \$1,500 from Computrol Division of Kidde Automated Systems, 15 Ethan Allen Highway, Ridgefield, Conn. 06877.

Full-Duplex Dial Modem Fits Asynch/Synch Modes

LEXINGTON, Mass. — Concord Data Systems, Inc. has introduced a Federal Communications Commission-registered, full-duplex dial modem said to operate at 2,400 bit/sec in both synchronous and asynchro-

nous modes.

The CDS 224 has a fall-back feature that reportedly enables a centrally located CDS 244 to accept data from modems transmitting at 1,200 or 2,400 bit/sec by adjusting itself to the speed and modulation of the incoming call. It also features automatic adaptive equalization and local and remote diagnostics, which include analog and digital self-tests and an internal test pattern generator/checker.

The modem is available for \$1,695 from Concord Data Systems, 442 Marrett Road, Lexington, Mass. 02173.

Bus Extender Allows Remote Communications

BEAVERTON, Ore. — Tektronix, Inc. has announced a general-purpose interface bus extender that allows communications between equipment up to 500 meters apart.

The extender converts parallel interface bus extender data to serial form. The device also appends various control signals and transmits the information to the remote end over a coaxial cable, the vendor said.

The product is available in two forms, the 4932 and the 4909FO2. The 4932 contains its own power supply and can be used in any general-purpose interface bus extender environment. It costs \$1,195.

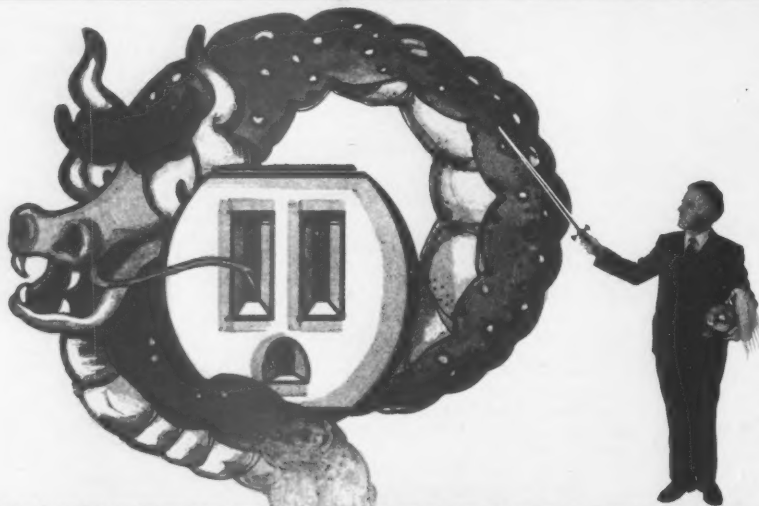
The 4909FO2 is a plug-compatible interface specifically designed for use with Tektronix Model 4909 multiuser file management systems and for remote users of Tektronix 4050 series desktop computers. The 4909FO2 costs \$2,095. The vendor can be reached through P.O. Box 500, Beaverton, Ore. 97077.

Vector Microcomputers Get Communications Controller

ST. PAUL, Minn. — Com Squared Systems, Inc. has introduced Comlink, a communications controller for Vector microcomputers. Comlink monitors communications lines such as TWX, telex or Direct Distance Dial while allowing the host computer system to be used for other functions, the company said.

In addition to a delayed transmission capability, Comlink incorporates such features as communications lines monitoring, telephone number storage and battery backup, the company reported.

The Comlink package costs \$3,100 with 16K bytes of memory or \$3,600 with 48K bytes of memory from Com Squared Systems at 278 Chester St., St. Paul, Minn. 55107.



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Micro-CPU Tool From Intel Gives Decision Support

SANTA CLARA, Calif. — A management tool said to provide decision support through a combination of distributed desktop computers and a controlled mainframe data base has been announced by Intel Corp.

The microprocessor-based product, Intel's Database Information System (Idis) 86/735, reportedly enables users to specify and summon mainframe data from and send data to a 16-bit system for local processing and relational data base operations. It is intended for nontechnical users who need local control over the entire process of seeking, defining and manipulating information.

Idis provides an unstructured view coupled with interactive access extension control of a mainframe data base, according to the vendor. It is an extension of the company's System 2000 data base management system (DBMS), which runs on mainframes manufactured by IBM, Control Data Corp. and Sperry Univac.

Idis reportedly is transparent and user-friendly. Users access the system by downloading mainframe data to the Idis workstations, where an IBM Sequential Query Language-like DBMS provides a relational view of the data, Intel said. Local data base operations can then be performed.

While the data processed by Idis is the same data maintained by the central DP facility, the central DP site does not lose control of information quality or integrity, a spokesman said.

At the heart of Idis is an Intel 8086 microprocessor coupled with 35M bytes of Winchester disk storage, 1M byte of floppy disk storage and 768K bytes of high-speed, random-access memory. Each Idis system can support up to five additional terminals. Increased terminal support and Ethernet compatibility are also planned for the future, the vendor said. The Idis system features Microsoft, Inc.'s Xenix operating system, a relational data base language, word processing, text formatting, spreadsheet utility, electronic mail, graphics capabilities, calendar/agenda functions and the C programming language.

Idis is priced at \$34,995. It is scheduled for general release in the first quarter of 1983, according to Intel, which is based at 3065 Bowers Ave., Santa Clara, Calif. 95051.

Data Entry Becoming Part Of Info Business: Expert

By Bob Johnson
CW New York Bureau

NEW YORK — Data entry is quickly becoming part of the overall business of information processing, according to William G. Moore, president and chief executive officer of Recognition Equipment, Inc.

Speaking at the recent Data Entry Management Association (Dema) conference held here recently, Moore told data entry managers that he sees trends within the computer industry for the remainder of this decade that will create a "new world" of data entry that sits within the realm of information processing.

As an example of the key role that data entry will play in our society, Moore cited the move of the U.S. to an information-based economy, requiring the use of hardware and software designed to speed the input and processing of data for greater productivity. Sixty percent of all people in the U.S. work force are employed in information processing, and that number will increase substantially, he noted.

Moore also pointed to the increased availability of venture capital to the com-



puter industry, noting that companies that have been holding back their equipment (Continued on Page 84)

puter industry, noting that companies that have been holding back their equipment (Continued on Page 84)

Stratus Removable Disk Drive Has 287M Bytes of Storage

NATICK, Mass. — A removable disk drive with 287M bytes of formatted capacity and supporting controller has been announced here by Stratus Computer, Inc.

Designed to operate with the company's Stratus/32 Continuous Processing System, the Model D105 disk drive reportedly uses 3330-type disk technology. It features a free-standing cabinet, 1.2M byte/sec data transfer rate and an average access time of 30 msec.

The Model D104 controller supports from one to four D105 disks, a spokesman said. The controller board incorporates logic to check itself continuously and to stop automatically before incorrect data can be transmitted.

The spokesman said the disks double the system's disk capacity from 2.3G bytes to 4.6G bytes per processing module and from 73.6G bytes to 147.2G bytes per sys-

tem.

The D105 disk drive and one disk pack costs \$33,000. The D104 controller costs \$9,000, the spokesman said from 17 Strathmore Road, Natick, Mass. 01760.

Alphaword Interface Fits Wang VS CPUs

FAIRFIELD, N.J. — Compuscan, Inc. has announced an interface that connects its units to Wang Laboratories, Inc.'s VS CPUs.

The Alphaword data entry unit can scan text typed on a standard single-element typewriter and enter it directly into the VS processor.

The Wang interface costs \$2,000. Alphaword III+ costs \$27,500, the vendor said from 81 Two Bridges Road, Building No. 2, Fairfield, N.J. 07006.

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DEC	RLO2K-DC	165.00	DEC Compatible	4473-2 (RMO5-P)	1,250.00
DEC Compatible	4443-2 (RLO2K-DC)	145.00	DEC	DFO3-AA modem	900.00
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SYSTEMS & PERIPHERALS

With 414M-Byte Storage Winnie Drive Out for VAX

MILPITAS, Calif. — System Industries, Inc. (SI) has announced a high-capacity Winchester disk drive option for users of Digital Equipment Corp.'s VAX-11 series of supermini-computers.

Called the 9751, the 10.4-in.-high unit reportedly provides up to 414M bytes of on-line storage. Average seek time is 18 msec and track-to-track seek time is 5 msec. The unit's throughput rate is 1.86M byte/sec.

Up to four 9751s can be mounted into an SI Series 6000 cabinet, yielding over 1.5G bytes of formatted storage in a single 19-in. by 26-in. footprint, a spokesman said.

A fully integrated 9751 is available for \$25,000 with dual-channel and

multiple-CPU configurations available, the spokesman said from 1855 Barber Lane, Milpitas, Calif. 95035.

Beacon Gets Expanded Graphics

LAKE MARY, Fla. — Florida Computer Graphics, Inc. has expanded the capabilities of its Beacon color graphics computer hardware system to run three additional graphics programs.

The Graphic Software Systems, Inc. GSS-4010 reportedly allows a Beacon system to emulate Tektronix, Inc. 4010, 4012 and 4014 graphics terminals and can be used to access a range of existing computer graphics soft-

ware. It allows the package to access a range of mini and mainframe computer graphics software supporting Tektronix graphics devices.

Any Graphic Software Systems, Inc. Plot 10-compatible software can now be accessed and displayed on the Beacon system.

The color graphics system is available for about \$20,000 from Florida Computer Graphics, 1000 Sand Pond Road, Lake Mary, Fla. 32746.

Centronics Adds Model 351 To Printstation 350 Series

The Model 351 is said to be the lowest cost multifunction, dual-mode printer in the series. Standard features include pin-addressable graphics, 200-char./sec DP printing, 65-char./sec proportional multipass-quality printing, operator-selectable forms length capability, self-test diagnostics and bidirectional logic-seeking printing.

The Model 351 costs \$2,195, with volume discounts available, from the firm at 1 Wall St., Hudson, N.H. 03051.



Printstation 350

Printer Systems Updates Unit

GAITHERSBURG, Md. — Printer Systems Corp. has announced an enhanced version of its 2780/3780-compatible printer subsystem, which is said to enable users to send job commands up to six 80-col cards in length.

The RJE/Multisignon subsystem will be a feature of the company's printer line, including letter-quality printers at 33-, 50- and 55 char./sec, matrix printers, dual-purpose matrix printers with correspondence-quality capability and band printers, the company said.

The RJE/Multisignon subsystem is priced at \$3,114 and up from Printer Systems. The firm is located at 9055 Comprint Court, Gaithersburg, Md. 20877.

Magi System Targets Solids Modeling

ELMSFORD, N.Y. — A solids modeling system that is said to incorporate constructive solid geometry analytical boundary file technology has been announced by Mathematical Applications Group, Inc.

Designed for computer aided-design and manufacturing (CAD/CAM) applications, the Magi system uses a three-dimensional modeling process called Synthavision, the vendor said.

The unit's boundary file provides output for dimensioned drawings, topology and data for numerical control tool-path routines. It also supplies the geometry needed to create finite element meshes used in stress analysis, according to a spokesman for the vendor.

The Magi system is priced from \$60,000 to \$125,000, depending on optional application packages, the vendor said.

Mathematical Applications Group is located at 3 Westchester Plaza, Elmsford, N.Y. 10523.

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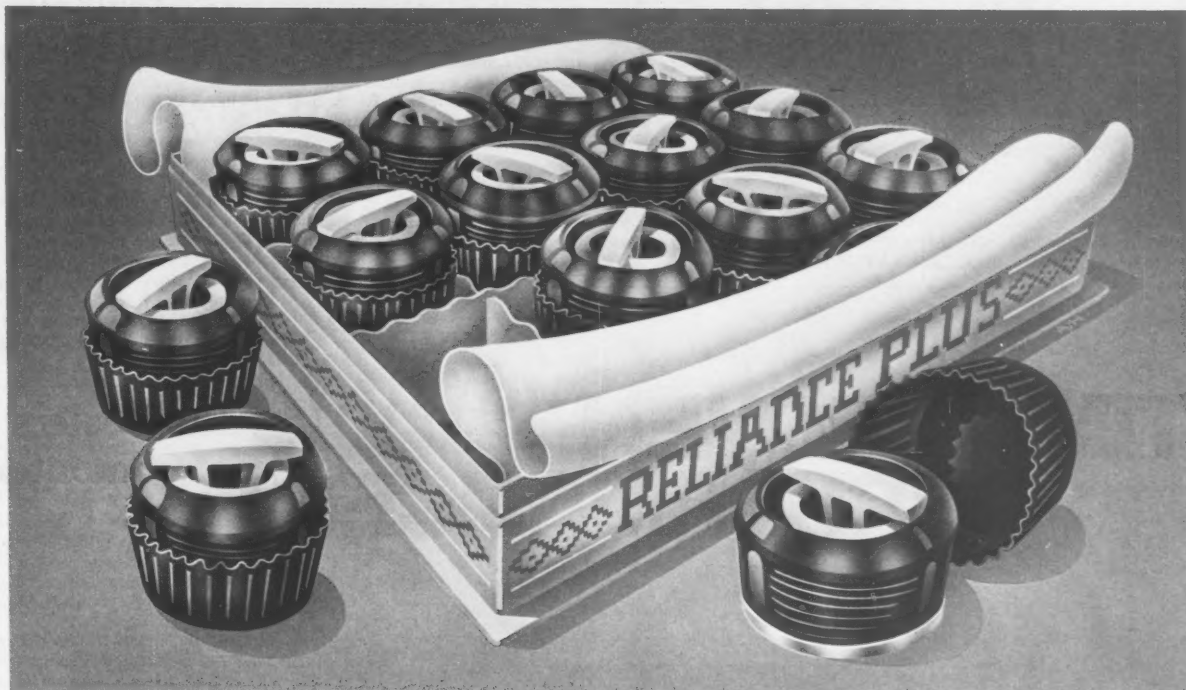
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Tektronix's option for its Model 4612 video hard copy unit (right) allows attachment to Digital Equipment Corp.'s VT100 terminal.

Tektronix 4612 Users Get DEC VT100 Compatability

BEAVERTON, Ore. — Tektronix, Inc. has announced an optional device for its Model 4612 video hard copy unit, which is said to make the unit compatible with Digital Equipment Corp. VT100 terminals.

With the newly announced option, the 4612 can be used with CRT terminals with resolutions at or near 768 pixels, the vendor said. By comparison, the standard 4612 is optimized for use with terminals offering a horizontal resolution of 640 pixels, such as the Tektronix 4025A display terminal.

There is no charge for the option when installed at the factory. A field-upgrade kit costs \$40. Tektronix

can be reached through P.O. Box 500, Beaverton, Ore. 97077.

Tektronix Hikes Product Prices

BEAVERTON, Ore. — Tektronix, Inc. has hiked prices an average of 2.7% for some of its products. The increased prices are effective immediately.

Included in the price hikes are the Model 4611 electrostatic copier, up 3%; the 4632 graphics hard copier, 4%; the 4014 graphics storage terminal, 1.5%; and the 4012 terminal with storage tube, 5%.

Tektronix, Inc. can be reached through P.O. Box 500, Beaverton, Ore. 97077.

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Auto Dealers Get Computers

DAYTON, Ohio — A family of computers designed for automotive, truck, motorcycle, farm equipment and lift truck dealerships has been announced by Reynolds & Reynolds Co.

Vim/Net makes in-house computing practical for dealerships of all sizes and offers a networking capability that allows users to expand to meet future needs, a company spokesman said.

The low-end 6000 system comes with 256K bytes of core memory, expandable through networking to 64M bytes, and features further expansion capability to 10G bytes and the ability to support 1,000 terminals, the vendor claimed. The mid-range 9000 has 512K bytes of main memory and 15M bytes of disk storage, and the high-end 12000 features dual CPUs, each with 513K bytes of main memory, the vendor said.

Of the three systems introduced, the 6000 will support seven terminals, the 9000 up to 15 terminals and the 12000 up to 32, the company said.

The Vim/Net 6000 is priced at \$19,800, the 9000 at \$29,800 and the 12000 at \$79,800 from Reynolds & Reynolds, P.O. Box 1005, Dayton, Ohio 45401.

Alphaword III Gets Wang Interface

FAIRFIELD, N.J. — Compuscan, Inc. has announced an interface that connects its Alphaword III Page-reader data entry units to Wang Laboratories, Inc. VS processors, reportedly increasing productivity by as much as 400%.

The Alphaword data entry unit can scan text typed on a standard single-element typewriter and enter it directly into the VS processor. The process is said to eliminate initial drafting, rekeyboarding, reformatting or coding of tasks.

The Wang interface costs \$2,000. Alphaword III+ costs \$27,500 from 81 Two Bridges Road, Building No. 2, Fairfield, N.J. 07006.

"Peugeot's automated manufacturing saves time, money and inventory through the unique capabilities of the Tandem NonStop System."

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With Special Width Specs Plotter Aids Auto Design

SANTA CLARA, Calif. — An electrostatic plotter designed to meet automotive design requirements

Voltage Regulators Protect Power Units

SAN DIEGO, — Topaz, Inc. has announced the Series 77000, a line of three-phase ac line voltage regulators for protecting computer systems against power fluctuations.

The voltage regulators accept voltage as low as 27% below nominal and correct it to within 7% of nominal within one cycle.

They are priced from \$3,000, the vendor said from 3855 Ruffin Road, San Diego, Calif. 92123.

with special width specifications has been announced by the Versatec Division of Xerox Corp.

The 8252-A features a wide vacuum channel, which removes excess toner, enabling high-contrast plotting at high speed, according to a vendor spokesman.

Company controllers link the plotter to most computers and display terminals, while the company's Versaplot software — a set of Fortran-callable subroutines compatible with basic pen plotter routines — allows use of standard plotting programs, the vendor said.

The 8252-A plotter is priced at \$83,000 from Versatec, 2805 Bowers Ave., Santa Clara, Calif. 95051.

Lease Plan for Graphics Line Announced by Vector General

WOODLAND HILLS, Calif. — Vector General, Inc. has announced that its VG 8250 Cadam, Inc.-based interactive graphics display line is now available on a lease as well as a purchase basis.

A typical \$200,000 graphics sys-

tem costs \$8,500/mo on a 24-month lease. Operating leases of 12, 18 and 24 months are available through a third party.

Vector General is located at 21300 Oxnard St., Woodland Hills, Calif. 91367.

Data Entry Described as Entering Realm of Information Business

(Continued from Page 79)
purchases because of the recession will soon start to buy again.

Other indicators, such as the proliferation of multifunction system de-

vices, including personal computers, the reduction in cost for memory and chip technology and a shortage of qualified workers to handle the new equipment, will also change the shape of data entry in the near future, according to Moore.

"This new era of data entry will create a world where the classic distinctions between head-down data entry, transaction processing, word processing, text editing, personal computing and so on will merge and blur. It'll be a world where keyboard familiarization will be a prerequisite not only for the data entry operator and secretary, but for the accountant, loading dock personnel, industrial relations specialist, middle executive and so on," he predicted.

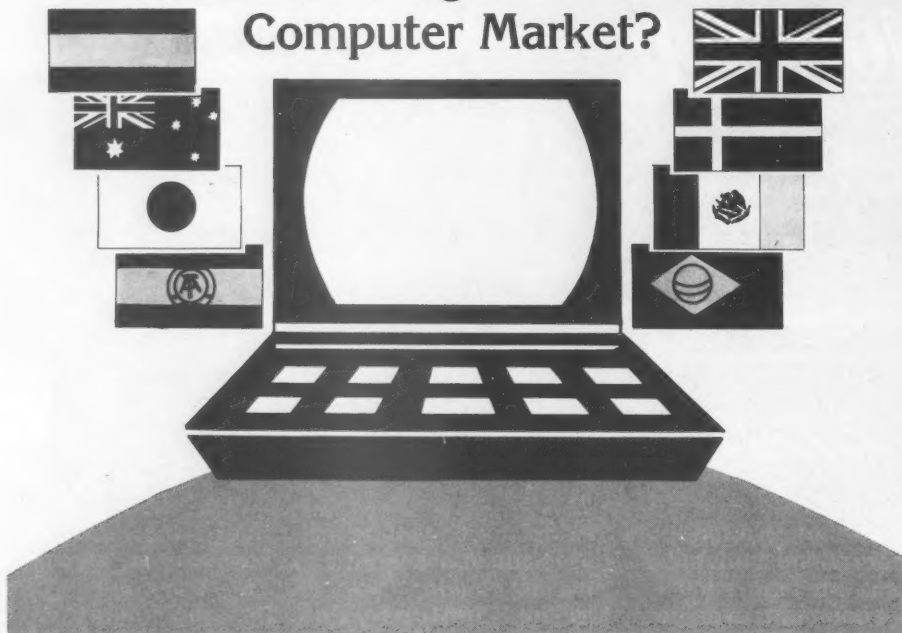
This new data entry environment will also create a number of problems, he added, maintaining that vendors will be unable to offer the "right" solutions to DP problems and that management and planning will create wide performance gaps between companies. He also warned that companies that fail to process, digest and discriminate large masses of data will sign their own death warrants.

This vision of data entry will offer the data entry professional substantial opportunities, however, according to Moore. He said that it will be a world where data entry managers' skills will be at a premium — not those skills as applied to the historical and traditional sense, but those as applied to the information processing needs of the next 20 years. He advised conference attendees to become visionaries with respect to the changes occurring in office automation and to hone their skills to adapt to the changes.

"Data entry managers are not traditionally visionaries. They have to change their habits in order to keep pace with the technology and to secure exciting career paths for themselves," he commented. He added that anything new, as the "new world" of data entry, implies changes that are sometimes difficult to face. He pointed out, however, that change must result in progress or it is worthless. "As managers whose specialties are data entry, data capture, source data automation or whatever, the key thing will be to engineer changes which yield progress," he maintained.

Moore claimed that data entry professionals represent the most "ideally positioned" group in DP to take advantage of the opportunities that lie ahead in the '80s and the '90s, but he cautioned that to do so demands a change in perspective.

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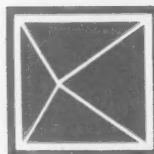
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Micros Viewed More 'Exciting'

Mini, Supermini Roles Changing: Report

By Bill Laberis
CW Staff

FRAMINGHAM, Mass. — Less than a decade ago, minicomputers and superminis were the darlings of the information processing industry. However, the situation has changed dramatically in the last two years.

Today, high-level managers and business users view the use of personal computers as being more "exciting" than minis. Nonetheless, the minis and superminis will continue to play a major, albeit changing, role in the DP environment, due in part to the migration from older 16-bit architectures to new 32-bit and advanced 16-bit systems.

These are some of the findings contained in a research memorandum entitled "The Use of Minicomputers and Superminis in Large Organizations," prepared by the International Data Corp. (IDC) here. The memorandum is based upon a survey of a broad cross-section of mini and supermini users in both distributed and stand-alone environments.

IDC found that most respondents displayed a tendency to stay with only the more well-known vendors, such as Data General Corp., Digital Equipment Corp. and IBM. This is often a good strategy for a large organization, as major vendors offer a line of products that can serve a variety of needs, using software that runs on a broad range of systems. Users can upgrade such systems without reworking all software.

But ignoring the upstart companies can prevent the organization from ever seeing and experiencing some of the newest leading-edge technology, IDC warned. Additionally, a major contract with a small company can result in an organization's getting preferential treatment by way of better service, lower pricing and pre-

lease products, IDC claimed.

Survey responses indicated further that most users found their mini and supermini systems became obsolete earlier than was anticipated. Thus, IDC cautioned users to take great pains in analyzing all relevant factors before purchasing a new system. (Continued on Page 91)

Nabu 16-Bit Micro Features Intel 8086, 8087 Co-Processors

OTTAWA — A 16-bit business microcomputer that features Intel Corp. 8086 and 8087 co-processors and can support up to three users has been announced by Nabu Manufacturing Corp.

The 1600 system features 256K bytes of random-access memory expandable to 512K bytes. Data storage is handled by a mass storage unit that incorporates a 10M-byte micro-Winchester hard disk drive and a high density minifloppy disk drive with storage for 800K bytes of formatted data, the vendor said.

Using standard asynchronous and synchronous links, the modularly designed 1600 can communicate with other computers or hosts and has the capability of providing access to broadband cable networks, the vendor claimed. Available software includes word processing, accounting, electronic spreadsheets, data entry and data base management, as well as



Nabu 1600

communications software to support asynchronous and synchronous communications, including IBM 2780/3780 or 3270 protocols, the company said.

Available for shipment in January, the 1600 includes CRT terminal and is priced at \$9,800 from Nabu Manufacturing Corp., 1051 Baxter Road, Ottawa, Ont., Canada K2C 3P2.

Convergent Technologies Offers Updated Workstation Version

SANTA CLARA, Calif. — Convergent Technologies, Inc. has introduced an updated version of its application workstation (AWS) series said to offer up to four times the performance of earlier units at no increase in price.

The AWS Turbo Workstation line matches the parameters and packaging of the

original line, with a significant boost in processing power and peripheral storage, a company spokesman said.

The Turbo reportedly multiplies processing performance through the use of an 8 MHz 16-bit Intel Corp. 8086 processor and through a proprietary memory management scheme said to increase the speed of memory access cycles. All CPU electronics and up to 512K bytes of random-access memory (RAM) are on a single circuit board.

The Turbo line is said to offer up to double the disk storage capacity than previous workstations through the use of double-sided, double-density floppy diskette drives. Up to 5M bytes of mass storage are available in a combination of minifloppy and mini-Winchester storage devices, the spokesman noted.

The desktop units can be interconnected into a local network via a high-speed data link. The Turbo incorporates the firm's Ctos operating system for real-time, multi-task operation and supports Cobol, Fortran, Basic, Pascal and assembly languages, according to the vendor.

The AWS-215 cluster station with 256K bytes of RAM and no mass storage costs \$4,790; the AWS-225 with 256K bytes of RAM and one double-sided, double-density floppy disk drive costs \$6,900; the AWS-235 with 256K bytes of RAM and dual floppy disk drives costs \$7,790; and the AWS-245 with 256K bytes of RAM, one floppy disk drive and a mini-Winchester drive, with a total of 5M bytes of mass storage costs \$9,990.

More information is available from the vendor at 2500 Augustine Drive, Santa Clara, Calif. 95051.

PE Cuts Price On 3210 by 16%

OCEANPORT, N.J. — Perkin-Elmer Corp. has cut the price of its entry-level 3210 processor by 16%. The firm also increased the disk capacity on the 3210 to 300M bytes and cut add-on memory prices for the system by as much as 61%.

The 3210 now costs \$42,000, including 512K bytes of main memory, clock and loader, console and integrated 32M-byte cartridge disk. The same configuration was priced at \$49,900.

Expandable to 4M bytes of main memory, the 3210 can now support either 80M- or 300M-byte disk drives. The system can also support up to 32 terminals.

Perkin-Elmer also cut prices on its memory modules using 64K-bit random-access memory chips. A 512K-byte memory expansion now costs \$5,000, a 61% reduction from the previous price of \$12,900. A 2M-byte memory expansion was reduced 38% from \$25,900 to \$16,000, the vendor said.

The vendor is located at 2 Crescent Place, Oceanport, N.J. 07757.

PDP-11/23 Mini Includes 70M-Byte Winnie

CAMBRIDGE, Mass. — Cambridge Digital Systems has announced an integrated PDP-11/23-based minicomputer with a 70M-byte Winchester disk and 20M-byte streaming tape. The system debuted at the recent Independent Research-Sharing Time-Sharing System Users Society (Irus) meeting held in Boston.

The System 94 computer can be used as a stand-alone or rack-mounted processor. It offers 256K bytes of MOS random-access memory (RAM), expandable to 4M bytes; four serial I/O ports and an extended large-scale integration backplane.

An integral memory management scheme allows users to access directly up to 22 bits of address space or 4M bytes of RAM. The Winchester drive is formatted as two RK07 and one RK06 drives on a single controller. All hardware is mounted on less than half the available backplane space, allowing a variety of expansion options.

Fully supported operating systems include an enhanced multiuser, time-sharing operating system based on Bell Laboratories' Unix System III; an RT-11 single-user, real-time system; an RSX-11M multiuser, real-time system; and a TXS-Plus multiuser executive for the RT-11 operating system, the spokesman said.

The System 94 costs \$20,000 from Cambridge Digital Systems at 65 Bent St., Cambridge, Mass. 02139.

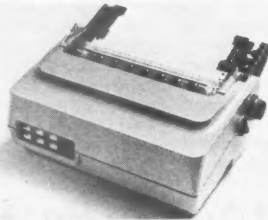
INTERNETWORK

Tally Printer Announced For Micro-Based Systems

KENT, Wash. — Mannesmann Tally Corp. has announced a 160 char./sec printer for microcomputer-based systems.

Called the MT 160, the unit offers a dual-mode operation that prints both correspondence-quality and high-speed data processing text, the vendor said. The 80-col impact printer features a high-density 40 by 18 matrix character that can be printed at 40 char./sec.

The Model MT 160 features bidirectional printing in the logic-seeking print head travel and accelerated tabbing in a data processing mode. Letter-quality features include proportional spacing, margin justification,



Model MT 160

automatic centering and daisywheel code compatibility, the vendor said.

The printers cost from \$845, the vendor said from 8301 S. 180th St., Kent, Wash. 98032.

Sonic's Diskless System Boards Feature 256K-Byte Memory

FORT LAUDERDALE, Fla. — Sonics Micro Systems, Inc. has announced what it claims is the first diskless computer system, designed to eliminate the system's dependence on disk drives and to allow greater user flexibility.

Net 1 features a fully intelligent hardware package consisting of a random-access memory (RAM) and read-only memory (ROM) disk on a board, with the RAM component expandable to 256K bytes of memory and operational at 200 nsec, according to a spokesman for Micro Systems.

On-board jumpers expand the operations to 1M byte, while the ROM disk has an access time of 150 nsec,

the company said. The plug-compatible ROM disk cartridges supply the user with 256K bytes of removable program storage.

The Net 1 system is priced at \$2,100 and is available from Sonics Micro Systems, Inc., which is located at Suite 409, 1500 N.W. 62 St., Fort Lauderdale, Fla. 33309.

Color Plotters Target Micros

SHENANDOAH, Ga. — Yokogawa Corp. of America has announced two four-color plotters for users of small business and home computers.

The PL-1000 can handle any paper size up to 11 in. by 15 in. and will produce foil transparencies for overhead projection. The unit features a standard RS-232 interface and firmware commands and costs \$1,200, the vendor said.

The Graphmate is a stand-alone four-color graphics plotter that can reportedly be programmed to perform a variety of complex data plots. The unit prints graphs using four ceramic tipped pens. Graphs can be produced on 8½-in. by 11-in. paper or on foils for overhead transparencies, the vendor said.

The unit costs \$2,800, the vendor said from 2 Dart Road, Shenandoah, Ga. 30265.

Fat Cat Interface Fits 82A Printer

SOUTH HACKENSACK, N.J. — Communications Devices, Inc. has announced the Fat Cat printer interface.

The interface fits inside an Okidata Corp. 82A printer and gives the unit 16 switch-selectable transmission rates ranging from 45.5 bit/sec to 1,200 bit/sec. In addition, the device gives the user six different code sets, the vendor said.

The interface board costs \$270. If purchased with the 82A printer, the combined purchase price is \$750. The vendor can be reached through P.O. Box 2043, 290 Huyler St., South Hackensack, N.J. 07606.

Two Printer Products Released for Wang

RALEIGH, N.C. — Southern Data Systems, Inc. has announced two printer interface products for Wang Laboratories, Inc. 2200 SVP/LVP/MVP series computers.

The PS-1 printer interface adaptor allows Wang users to attach the Qume Corp. Sprint 9 series daisy-wheel printer as a local printer for the Wang 2236 DE workstation. It costs \$200.

The PS-2 Dual Port Parallel/Serial Print controller allows either Centronics Data Computer Corp. parallel or RS-232C serial printers to be used with Wang systems. It can drive Centronics printers from up to 75 feet away or RS-232C printers up to 2,000 feet away, a spokesman said. The PS-2 costs \$450 from 5109 Holly Ridge Drive, Raleigh, N.C. 27612.

TSX-PLUS™

Time Share RT-11

TSX-Plus™ is a high-performance, general purpose time-sharing extension to the RT-11 operating system for Digital Equipment Corporation PDP-11 computers with memory management. TSX-Plus™ provides the functionality of the Digital RT-11 operating system to multiple users on a time-sharing basis.

TSX-Plus™ should be used:

- to time share the RT-11 environment,
- to increase the productivity of software development,
- to provide a general purpose, multi-language, multi-user operating system environment for data processing, real-time control, software development or training.

RT-11 Compatibility: Most RT-11 programs can be used with TSX-Plus™ without change or relinking. TSX-Plus™ interfaces with standard RT-11 device handlers (XM version) and supports RT-11 utility programs such as PIP, DIR, DUP, MACRO, TECO, KED and K52 (The FOR-MAT program is not supported). Language processors available for use with TSX-Plus™ include COBOL-Plus™, FORTRAN, BASIC, DBL and Pascal-2. The TSX-Plus™ keyboard commands are an extended set of those provided by RT-11. TSX-Plus™ system service calls (EMT's) are compatible with those provided by RT-11.

Efficiency: TSX-Plus™ overlaps terminal interaction time, I/O wait time and CPU compute time for all jobs on the system. The result is a tremendous increase in the productivity of the computer. Compute-bound jobs can soak up idle time while many users perform file editing, program development or data entry.

Productivity: A TSX-Plus™ facility known as "virtual lines" allows a single user to control several tasks from a single terminal. TSX-Plus™ allows the same machine to simultaneously support production use, program development and real-time control.

Real-time support: TSX-Plus™ provides a real-time program support facility that allows multiple real-time programs to be run concurrently with normal time-sharing operations. Real-time programs may optionally lock themselves in memory, directly access the I/O page and connect device interrupts to subroutines within the program. The real-time facility can generally handle up to 100 interrupts per second.

Data and Directory Caching: A data and directory caching facility allows the TSX-Plus™ manager to allocate caching buffers to hold in memory a number of directory entries and/or data buffers. This eliminates all disk I/O when requests are issued by programs for entries that are currently in the cache buffers. The information kept in the cache buffers is managed using a least-recently-used (LRU) or most-active algorithm.

Shared run-time systems: TSX-Plus™ allows one or more shared run-time systems or data areas to be mapped into the address space of multiple TSX-Plus™ time-sharing jobs. This saves memory space when multiple users are running the same types of programs (e.g. COBOL-Plus™ or DBL) and can also be used in situations where programs wish to communicate through a shared memory region.

Additional features: Other features offered by TSX-Plus™ include detached jobs (a batch facility), a transparent line printer spooling system, a logon and usage accounting system, shared file access control, inter-job message packet communication, command files with parameters, the ability for the user to define system commands, and a program performance monitor that will print a histogram showing where a running program is spending most of its time.

Supports 4Mb on the PDP 11/23 Plus.



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Qantex Adds Interfaces

Tape Backup System Expanded

HAUPPAUGE, N.Y. — The Qantex Division of North Atlantic Industries, Inc. has expanded its Model 150 cartridge-tape backup system by adding a variety of interfaces, including those compatible with RS-232C and S-100 bus computers.

The Model 150 consists of a

Mini System Targets Optometry

MIAMI — A turnkey mini-computer system designed for use by optometrists, ophthalmologists and opticians has been announced here by TKS Corp.

The System 20/20 can be configured to include between 24M and 70M bytes of on-line storage, according to the company, enough to handle a practice of 30,000 patients. Hardware includes a 12-in.-high by 36-in.-deep computer configured by the vendor, a Televideo, Inc. terminal and Integral Data Systems, Inc. Prism 132 printer.

Specialized applications software includes patient communications, which reportedly classifies patients by a variety of user-selectable categories and can send personalized letters using the package's word processing function.

The system includes a built-in model and communications capability with any CP/M-based system, the vendor said.

The complete turnkey system is available for \$24,995 from TKS Corp., located at 8510 N.W. 56th St., Miami, Fla. 33166.

Qantex 451C tape drive with controller, cable and power supply. Except for the RS-232C system, the system is provided with Q-Tip, a software driver on a single-sided, single-density 8-in. floppy disk.

The unit stores data from Winchester hard disks on a ¼-in. tape cartridge with a formatted capacity of 13.4M bytes. Data is file-oriented

and the device is menu-driven, the firm reported.

The upgraded 150s do not require any additional hardware or software to operate on computer systems using any of the new interfaces, according to Qantex.

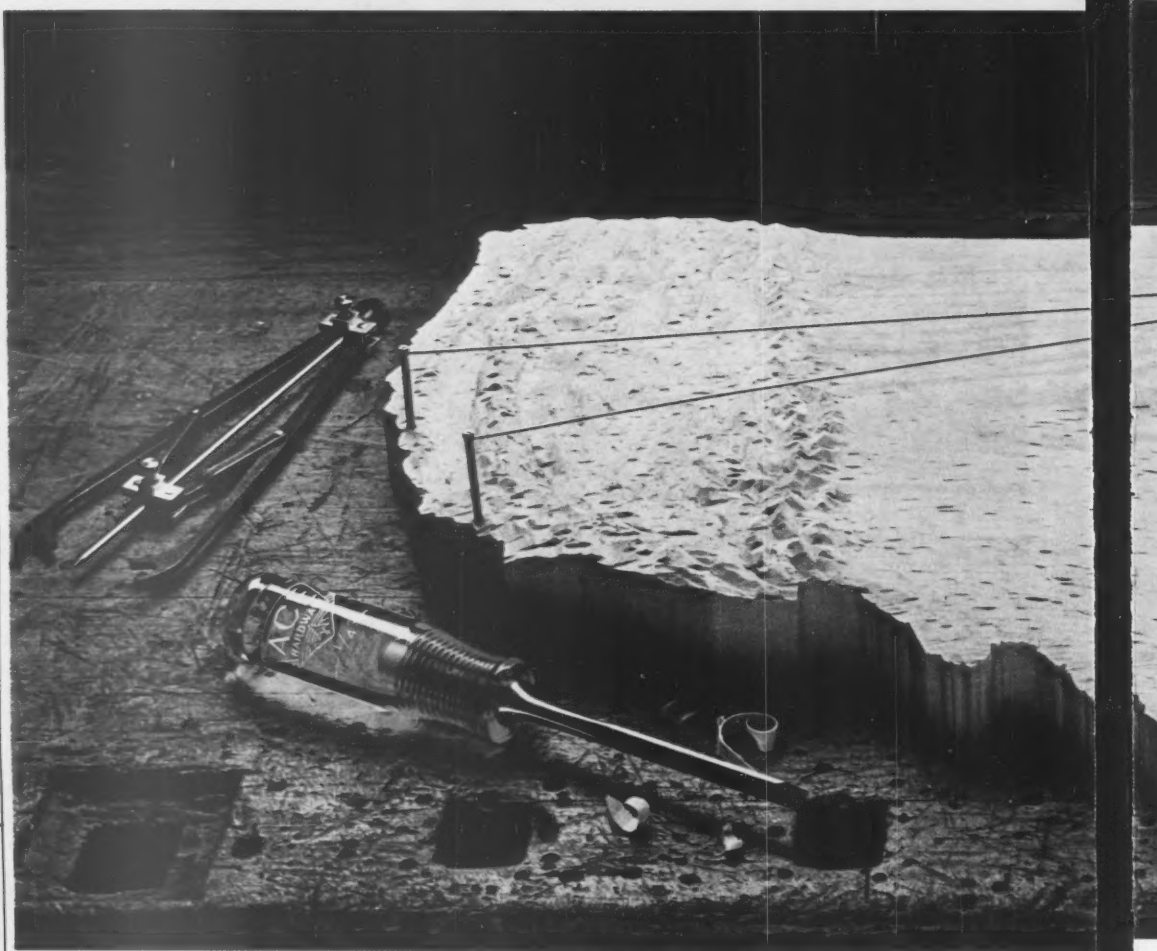
The Qantex 150 is available for \$2,995 to \$3,125, depending on interface, from 60 Plant Ave., Hauppauge, N.Y. 11788.

Intel Cuts iAPX 86 Prices

HILLSBORO, Ore. — Intel Corp. has announced price reductions of 7% to 40% on four 16-bit Multimodules and four Multibus-compatible, single-board computers, including the iSBC 86/30 single-board computer.

The iAPX 86-based products offered at the new prices are suited to meet the needs and specifications of both controller applications, such as industrial automation, process and machine control, as well as traditional minicomputer applications in areas such as communications, simulation and business computation, according to the vendor.

Details on the price reductions are available from Intel Corp., 5200 N.E. Elam Young Pkwy., Hillsboro, Ore. 97123.



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Distributed data processing with a network of IBM small systems

ACE HARDWARE SPEEDS UP SOFTWARE DEVELOPMENT, NAILS DOWN INFORMATION.

It takes the right tools to build a distributed data processing system that provides up-to-date information out in the field, while maintaining central-site control. Ace Hardware Corp. found the answer in a network of IBM small systems.

An IBM 8100 Information System in each of Ace's regional distribution centers has compressed the time it takes to process orders, while expanding both warehouse and programmer productivity. The 8100s are tied through phone lines to a host IBM 3033N in Ace headquarters in Oakbrook, Illinois. Ace—the second largest chain of retail hardware stores in the U.S.—is a coopera-

Bus Interpreter With Repeater Out for PDP-11s

ORANGE, Calif. — A bus interpreter assembly with a built-in bus repeater for users of Digital Equipment Corp. PDP-11, single-CPU systems has been introduced here by MDB Systems, Inc.

The MDB/MLSI-DWQ11 reportedly permits PDP-11 users to employ less expensive and more compact Q-bus memories and controllers or LSI-11 users to use Unibus memories and controllers.

The DWQ11 presents one bus load to the main system and the add-on bus can support up to 19 DEC dc bus loads, the company reported.

A spokeswoman said that a key feature of the interpreter is that it allows users to assign devices higher or lower direct memory access and serial interrupt priority than other devices on the main system.

The interpreter uses the

four-level interrupt structure of the PDP-11 Unibus and LSI-11/23 Q-bus and automatically defaults to a compatible single-level interrupt

mode on the Q-bus side for LSI-11/2 processors, the spokeswoman noted.

The unit includes one quad-size module (Unibus),

one dual-size module (Q-bus) and a 10-ft cable set. It costs \$1,050 from 1995 N. Batavia St., Orange, Calif. 92665.

Mini's World Changing: Report

(Continued from Page 87)
tem or upgrading an existing one.

As a rule, IDC said, "It is best to stay current with the

vendor's most advanced product line" as "the newest generation of software and communications utilities will most likely be available

for the new systems."

In addition, the central DP department should retain a certain measure of control over user departments considering the purchase of a stand-alone mini or supermini, IDC said. In this way, the organization as a whole can better prepare for the future linking of stand-alone systems into a distributed network, something that could be difficult, if not impossible, if the linkup involves the minis of several different vendors.

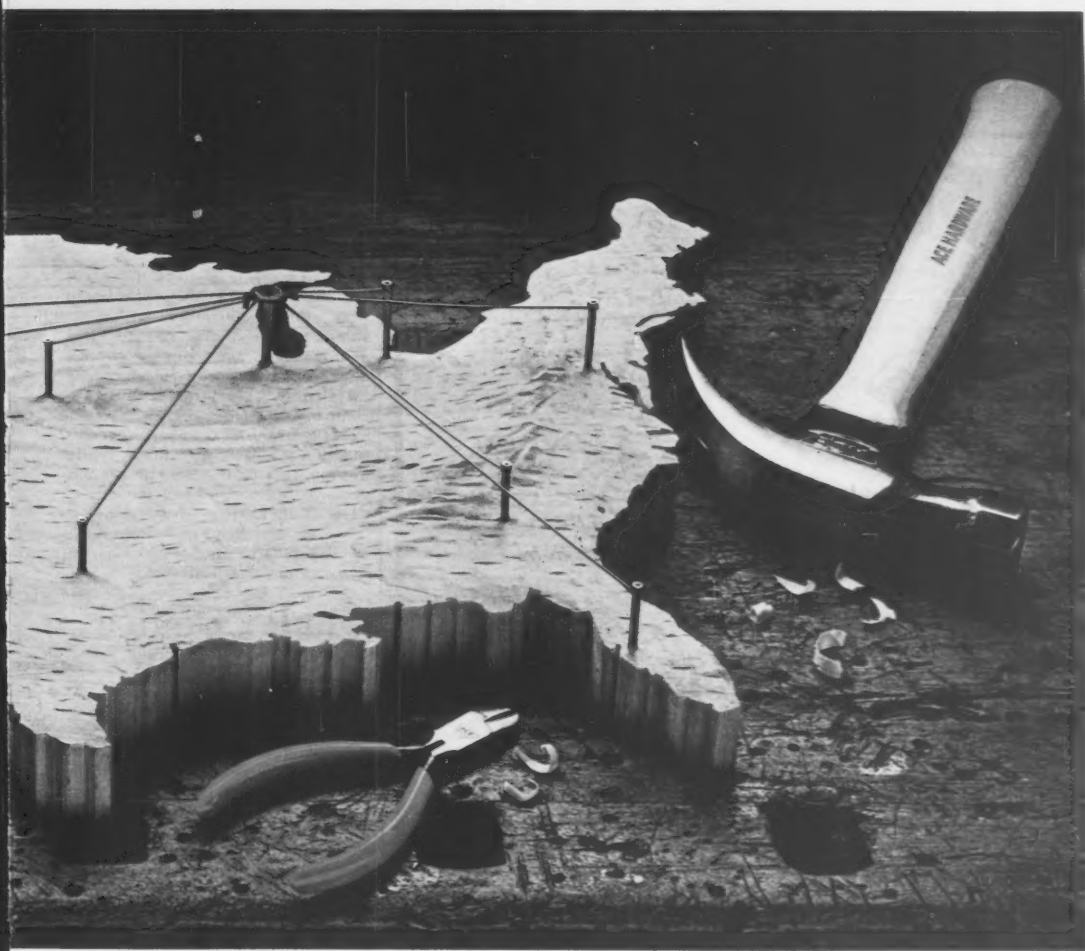
"The most important point ... is that distributed system growth is an almost certain prospect," the report said.

Judging from survey results, IDC found that stand-alone systems are being used primarily for accounting or engineering applications, while distributed systems tend to have fewer but more complex applications per system. The latter applications were developed almost entirely in-house and included order entry and manufacturing-type applications.

In asking users for their assessment of critical features of minis and superminis, IDC found applications software to be one of the more important ingredients of a system purchase. Within a distributed system, communications software becomes a dominant concern.

And with the increase of nontechnical users, respondents rated user friendliness high on the list of crucial features of a mini or supermini.

More information on "The Use of Minicomputers and Superminis in Large Organizations" is available from the Information Systems Planning Service at International Data Corp., 5 Speen St., Framingham, Mass. 01701.



tive acting as a wholesaler to 4,000 independent retailers.

Perfect Fit

"The IBM 8100 fit perfectly into our long-range information strategy," says Jim Van Wert, Director of Information Services for Ace. "We've been committed to a network tightly controlled from the host site, yet at the same time, able to provide support to our end users. Distributed data processing via the 8100 has accomplished all our objectives, and more."

Van Wert points out that Ace wanted a distributed system that would permit central development

of remote application programs, rather than placing DP staff in each warehouse. Ace also wanted to assure the integrity of information at the warehouses through backup at headquarters.

Dramatic Gains

"The 8100 has not only met those requirements," Van Wert reports "it also helped programmer productivity to the point where it took half the expected time to write applications and bring the programs on line."

"We demand the same high degree of service from the companies we deal with as our dealers expect

from us. With IBM, we've always received it, from the excellent people who helped us develop the applications to the service representatives across the country who can get there fast if we need help."

"Distributed data processing was waiting to happen at Ace. The 8100, made it happen."

For details on how a network of IBM small systems could help put distributed processing on your map, write IBM, 1 Culver Rd., Dayton, NJ 08810. Or call, toll-free, IBM Direct 1 800 631-5582, Ext. 90.

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Two 32K-Byte Memory Boards Targeted for DEC LSI-11 CPUs

SUNNYVALE, Calif. — Two memory boards said to offer direct compatibility with all Digital Equipment Corp. LSI-11 processors have been introduced by Intersil Systems, Inc.

The IMC-11/23 Q-Bus-compatible Cmos memory card features 32K bytes of main memory, a capacity of 16K words of 16-bit length, memory response access time of 300 nsec and low current, the company said. The MCB-364 Cmos static memory card utilizes industry-standard 16K-byte Cmos static random-access memories and has on-board rechargeable batteries that provide data retention of up to 14 days, the vendor claimed. With full IEEE-796 compatibility and up to 64K bytes of data storage, the

card may be used on both 8- and 16-bit microcomputers.

The IMC-11/23 is priced at \$895, and the MCB-364 at \$1,195, from Intersil Systems, 1275 Hammerwood Ave., Sunnyvale, Calif. 94086.

Board Converts CBM 8032 to Superpet

WAYNE, Pa. — Commodore Business Machines, Inc. has announced the availability of a single-board upgrade said to convert its CBM 8032 microcomputer into the company's Superpet.

The upgrade board will provide six languages from Waterloo Computing

Systems Ltd.: Microbasic, Micropascal, Microfortran, Microapl, Microcobol and 6809 assembler, the company said.

The upgrade board is priced at \$795 from Commodore Business Machines, 487 Devon Park Drive, Wayne, Pa. 19087.

Disk Control Board Simplifies Interface of S100 Bus With Drive

by Standard Microsystems Corp.

The FDSC100 incorporates an integrated digital phase-locked loop for high data integrity and data separation, according to the vendor.

It is both IBM 3740 and System/34 compatible and has both memory-mapped and I/O-mapped capabilities, Standard Microsystems said.

Also, the device may be polled or interrupt-driven for maximum software flexibility, the company said.

The FDSC100 is priced at \$395 from the firm at 35 Marcus Blvd., Hauppauge, N.Y. 11788.

Tape Option Moves Data

SANTA CLARA, Calif. — Plexus Computers, Inc. has announced a cartridge tape drive option designed to let users move data, applications and programs from the company's one- to 24-user P/40 system to its eight- to 16-user P/25 system.

The optional P/40 module makes use of the P/40's 16-bit intelligent mass storage controller, which assumes tape and disk control tasks and manages mass storage control operations that otherwise would be handled by the system's CPU, the company said.

This frees the CPU to perform computation-intensive functions, while improving overall system power and performance, the vendor claimed.

The P/40 cartridge drive optional module is priced at \$4,000 from Plexus Computers, Inc., 2230 Martin Ave., Santa Clara, Calif. 95050.

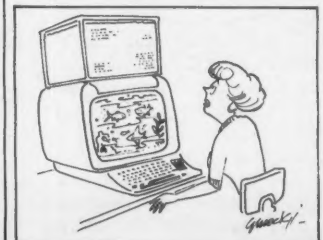
Qualex Device Made for HP

WESTLAKE VILLAGE, Calif. — Qualex Technology, Inc. has announced the 1400 Shared Mass Archive Storage Host (Smash) controller which allows users of three or four Hewlett-Packard Co. HP 3000 HP interface bus (HP-IB) systems to share a single Qualex Group 3000 tape system.

Designed to operate with any combination of HP-IB Series 3000 Models 30, 33, 40, 44 and 64, the 1400 Series Smash controller mounts inside the Group 3000 tape drive, Qualex said.

The unit reportedly has a front-mounted select switch to allow the operator to switch between various CPUs. Eight meter cables are provided for CPU connection.

The controller costs \$1,500, the vendor said from Suite 110, 31220 La-Baya Drive, Westlake Village, Calif. 91362.



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Unveils 8845, Terminals, Software

Nixdorf Expands Integrated Office System

WALTHAM, Mass. — Nixdorf Computer Corp. has unveiled a configuration of its 8845 Integrated Office System, IBM 3274/3278-compatible CRT terminal products, hardware and software for its IBM-compatible 8890 processors and software for its 8840/5 word processors.

The 8845 Integrated Office System (Nios) is said to cost less than previously available models. It consists of the 8845/4 processor, a 33M-byte disk, a tape drive, diskette, workstation and 45 char./sec printer. Available now, it costs \$30,227 to purchase or \$720/mo to lease.

The Nios system uses Nixdorf's Editor, a high-level business programming language, to provide DP capabilities. Editor commands parallel Cobol commands and, like Cobol, generates efficient application programs that permit the user to tailor the system to specific requirements, Nixdorf said.

The 8270 is an IBM 3274/3278-compatible display system. It consists of three basic components: control units (8274-B1/B11), display workstation units (8278-2) and workstation printer units (8287/8289). The 8274 control unit was designed specifically to meet the needs of users who require many locally connected worksta-

tions and/or multiple remote clusters of a few workstations.

The 8278-2 display workstation is a CRT terminal with keyboard.

The 8287/8389 workstation printers are available in a wide selection and are connected directly to a CRT terminal rather than to the control unit. They are fully buffered and treated as independent devices.

Prices for typical 8270 local-cluster systems range from \$47,000 for a cluster of 32 workstations to \$400,000 for a cluster of 160 workstations.

The new software components for Nixdorf's 8890 systems include a release of Nidos/VSE, the 8890 operating system and an interactive time-sharing system based on Bell Laboratories' Unix. New 8890 hardware components include two disk drives and a tape drive.

Release 2

Nidos/VSE Release 2 is IBM DOS/VSE-compatible and is said to incorporate features previously available only with IBM's OS/VS1 and MVS operating systems. It provides support for a maximum virtual address space of 16M bytes and for 12 virtual and/or variable-real partitions of

work area. It is available for a monthly license fee of \$395 plus a monthly maintenance fee of \$265.

The interactive time-sharing system based on Unix is available through the Nidos/VSE Programmer Workstation System (PWS/VSE). Through its user orientation, it extends the power of the computer to multiple terminal workstation users and facilitates interactive program development and maintenance. It is available for a monthly license fee of \$135 and a monthly maintenance fee of \$20.

The two IBM-compatible fixed disk drives being offered, the 8310-11 and 8830-1, cost \$10,320 and \$10,105, respectively. The 8409 tape drive provides high-speed save/restore capability for fixed direct-access storage device as well as satisfying other tape processing requirements. It costs \$8,675.

Link III is a software package that permits communications between Nixdorf 600 series distributed processing systems and Nixdorf 8840/5 word processing systems. It is written in the Editor language. It costs \$50/mo.

A math package for the 8840/5 is also available. It costs \$500, Nixdorf said from 300 Third Ave., Waltham, Mass. 02154.

OA Not Technology-Intensive: Report

By Bob Johnson

CW New York Bureau

NEW YORK — The word processing industry should continue to grow over the next five years. However, specific trends will determine what technology and which vendors will be successful in the market.

That is what was reported in a recent study titled the "Trends in Office Automation: The Word Processing Industry," done here by the research firm of Sanford C. Bernstein & Co.

Analyzing these trends, the study concluded that the industry is not technology-intensive. It said that most systems available today are composed of off-the-shelf hardware and the only real differences are in the software features and in system packaging.

Although these features can offer a competitive edge, they can be easily copied by competitors, and this factor has to be considered when predicting

'The most important influence on word processing and on office automation will be in the area of communications... Besides the fact that communications capabilities change and will continue to change traditional word processing equipment into hardware capable of storing and processing data, communications carries a number of important marketing implications that will influence the market.'

the future of the market, the researchers noted.

The most important influence on word processing and on office automation will be in the area of communications, according to the study. Besides the fact that communications capabilities change and will continue to change traditional word processing equipment into hardware capable of storing and processing data, communications carries a number of important marketing implications that will influence the market.

The report predicted that the advent of communications will allow to prosper vendors who carve out a niche within the office market by supplying either one or a few components of a system.

The researchers believe standards, along with protocol conversion, will evolve to permit communications between the products of all vendors. "Such compatibility would permit customers to select the best piece of equipment for each function of the office system, thereby enabling specialized

vendors to remain competitive, if not to become stronger in their respective specialties," the study said.

Large integrated system vendors will not be without advantages because of this change, the report pointed out, but offering complete systems will not hurt the specialized vendor who can offer attractive price/performance advantages.

Communications will also serve to diminish or eliminate the distinction between stand-alone and clustered word processing systems, according to the study. It explained that clustered systems evolved through attempts to reduce unit costs by sharing terminals that were once expensive parts of the word processing system. Now, however, because of the drop in cost for microprocessors and storage, the advantage of the clusters has waned while their liabilities, such as being

(Continued on Page 94)

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Four-Phase Series IV, Series 5000 Get Micro Option

CUPERTINO, Calif. — Four-Phase Systems has announced that its Series IV and Series 5000 multi-function workstations can be turned into personal computers.

With the personal computing option PC I, the Series IV workstation can be used as a personal computer. With PC 2, the Series 5000 workstation can also be used as a personal computer.

This is said to allow users access to office automation functions and to run personal computer application programs such as trend and financial analyses, data comparisons, mathematical modeling and business accounting.

Each model of the personal computer can interface with most communications devices via an RS-232 port. Asynchronous, binary synchronous communications and synchronous data link control are supported.

Each PC1 and PC2 configuration consists of a microprocessor with 128K random-access memory; Digital Research, Inc.'s operating system, CP/M; and two 5¼-in. floppy drives. They are available for \$3610 each. An RS-232 port can be purchased for \$1,945 from Four-Phase Systems, 10700 N. DeAnza Blvd., Cupertino, Calif. 95014.

3M Offers Telex Terminal, Automatic Dialer Accessory

ST. PAUL, Minn. — 3M Corp.'s Business Communication Products Division has introduced a communication terminal said to connect to F1/F2 Telex lines and offer keyboard dialing, automatic case shifting of figures and letters and 4K semiconductor memory. At the same time, the firm also unveiled an automatic dialer for its facsimile transceiver systems.

The Whisper Writer Package 83 Telex Communication Terminal comprises two modules: the Model 1483 Telex receive-only teleprinter and the Model 1446 intelligent keyboard. The terminal permits keyboard dialing without external equipment and

remembers the last number dialed. It is available for \$1,190, according to the vendor.

The Autodialer automatic dialer accessory was designed for 3M's EMT 9140, 9160, 2700 and 2000 facsimile transceiver systems. The accessory can be placed under a telephone and is said to enhance unattended transmission. It stores 10 telephone numbers of up to 50 digits each and also has a clock that displays both real and delayed time. A battery backup is also included to ensure that stored numbers will not be lost if a power failure occurs, a vendor spokesman said.

The Autodialer is available for \$375. More information about both products is available from 3M, which can be reached through P.O. Box 33600, St. Paul, Minn. 55133.



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(Continued from Page 93)

prone to system failure and the need for dedicated wiring, have remained. "The advent of communications makes all systems multiterminal while retaining the desired intelligence and storage on a local, dedicated basis."

Significant Trend

Another significant trend, according to the study, is DP capabilities on word processing systems. The report noted that the primary focus on word processing systems will in fact be text preparation, storage and retrieval, but DP features will be an attractive incentive, especially for the middle and upper priced segments of the market. "Since word processors are a specialized application of microcomputer and microstorage technology, software alteration can permit their use in more generalized DP applications."

Market participants are already moving to offer such capability and the trend is expected to become more pronounced in the future," the study said. Modularity — the offering of a product line that moves upscale or downscale by the addition, deletion or substitution of key components of a basically similar system — is also a trend to be noted, the report stated. Because this approach offers users optimum word processing capabilities with minimal cost, the report views vendors who offer this capability as being the winners in the word processing market. The study also mentioned the sophistication of ergonomics as being an influential market trend.

It said, "It is primarily the 'friendly' user interface as well as advanced features that allowed the smaller vendors the niches they have won. Larger vendors, with their strong DP background, have not addressed the needs of relatively unsophisticated users as effectively." It added that the problem is being dealt with, but small vendors who offer more ergonomic products will be able to hold on to their market share in the near future.

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*Ken Parker, President
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Expands Processor Line

NCR Adds Firststep to Worksaver Line

DAYTON, Ohio — NCR Corp. has expanded its Worksaver line of data and word processors by introducing Firststep, an entry-level model featuring document compatibility with other Worksaver models. NCR also unveiled an optional Digital Research, Inc. CP/M 2.2 operating system and the Microsoft, Inc. Multiplan financial software package.

Using CP/M 2.2, Firststep has the capability of running numerous prepackaged programs that are currently available. CP/M 2.2 costs \$200. Multiplan costs \$250.

Worksaver Firststep is compatible with other Worksaver models through a document transfer and conversion technique resident in the

Wordready software program used on previously released systems. Through a physical disk transfer or communications links, documents created on Firststep systems can be used on other Worksaver systems.

Firststep models operate under the control of a software program called

Firstword. It costs \$500.

The basic Firststep package includes a 12-in. CRT monitor, a microprocessor-based controller with 64K bytes of memory and dual 5¼-in. diskette drives and a specially designed keyboard. It costs \$3,795, NCR said from Dayton, Ohio.

Daisywheel Printer Released

BOHEMIA, N.Y. — Primages, Inc. has introduced a letter-quality daisy-wheel printer that operates at 45 char./sec and uses a 100-spoke daisy-wheel.

The Image I has an optional sheet feeder that handles pages in either portrait or landscape format. The

printer uses a patented control technology said to allow the use of lower cost stepping motors instead of the more expensive servo motor drives.

The printer costs \$1,650, and the sheet feeder costs \$275. Primages is located at 620 Johnson Ave., Bohemia, N.Y. 11716.

Office System Accommodates Five Users

REDWOOD CITY, Calif. — Product Associates, Inc. has announced the Z-Disk, a desktop, multiuser office system based on the Zilog, Inc. Z80A microprocessor.

The unit can provide word processing, file processing, electronic mail and specialized office forms output functions. The system was designed for use by unsophisticated users featuring a menu-choice selection and a mouse for menu selection. The processor is based on Digital Research, Inc.'s MP/M and CP/NOS software and Kodak Corp.'s Comstar software, the vendor said.

The Z-Disk comes with 64K bytes of random-access memory, up to 40M bytes of Winchester disk storage and a floppy disk drive. The system can accommodate up to five users, the vendor said.

The Z-Disk costs from \$2,995, the vendor said from 465 Convention Way, Redwood City, Calif. 94063.

Zenith Releases Mail Software

GLENVIEW, Ill. — Zenith Data Systems has introduced electronic mail software for its desktop computer line that is said to allow users to send mail anywhere in the U.S. and Canada.

The software, called Zgram, was designed for communications between 10 or more Zenith desktop computers. Its features include administrative control, unattended operation, automatic retrieval of transmission, transaction logs, multiple telephone line access, data encryption, error checking, acknowledgment and reply, according to a vendor spokesman.

Zgram is available for a one-time license fee of \$10,000 from Zenith Data Systems, 1000 Milwaukee Ave., Glenview, Ill. 60025.

Messaging System Fits Telecom's SL-1

RICHARDSON, Texas — Northern Telecom, Inc. has announced an automated text messaging system for its SL-1 digital business communications system.

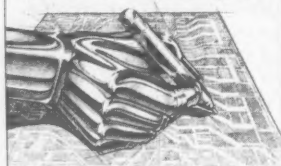
The Integrated Messaging System software and a messaging protocol are said to permit two-way communications between the SL-1 private branch exchange (PBX) and an attached information processor through an RS-232C interface.

The SL-1 PBX converts coded data from telephone sets into messages for the attached information processor. The system reportedly also transmits information from the processor to the SL-1 PBX, which activates message-waiting indicators on the appropriate telephone sets, the vendor said.

A single-station system capable of handling messages for 200 people costs \$31,000 and includes the firm's Model 585 processor, CRT terminal and software, a spokesman said from 1001 E. Arapaho Road, Richardson, Texas 75081.

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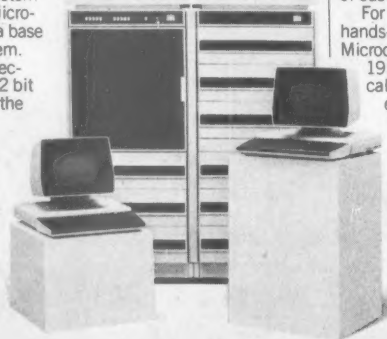
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A Glimpse Into the Industry's Future

• CAD/CAM Mart Sees Rosy Future

By Tom Henkel
CW Staff

CLEVELAND — The market for computer-aided design and manufacturing (CAD/CAM) just exploded. Hardware is getting cheaper, new software developments abound and new technological developments are opening more markets for CAD/CAM systems.

That rosy picture was painted by Predicasts, Inc., a consulting firm here that predicts a 31% average growth rate for the CAD/CAM industry over the next 20 years. A report released by the firm says the 4,600 CAD/CAM systems installed last year will blossom into about 190,000 installed systems by the end of 1995. Furthermore, the report says the biggest growth rate for the CAD/CAM market is happening right now. During the early '80s, Predicasts said, CAD/CAM applications will grow by 41% annually.

Mechanical design of solid models with color enhancements for stress design is currently the hottest market for CAD/ (Continued on Page 100)

• Growth in '83 Seen For Semiconductor

By Robert Batt
CW West Coast Bureau

SANTA CLARA, Calif. — The semiconductor industry can expect only sluggish growth in 1982 followed by a "mini boom" from 1983 to 1985, according to the latest forecast statistics from the Semiconductor Industry Association (SIA).

In its "Semiconductor Forecast 1982-1985," the SIA paints a picture of continued industry growth. For example, worldwide shipments of semiconductors by U.S.-based and European-based firms this year will jump to \$9.8 billion, a 6% increase over 1981. These shipments will increase a further 18% in 1983, reaching \$11.6 billion, followed in 1984 and 1985 by levels of \$14.1 billion and \$17.3 billion, respectively.

The SIA forecast concludes that the 1982 growth is being seen entirely in sales of integrated circuits, which are predicted to increase from a 1981 total of \$6.6 billion to \$7.1 billion by the end of this year. Sales of discrete circuits, forecast at \$2.7 billion for (Continued on Page 100)

• Services Firms Will Earn Profits Abroad

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — American DP services firms will generate an estimated \$4 billion in revenues from foreign operations this year, according to a recent report from the U.S. International Trade Commission (ITC).

ITC said that in 1981, the approximately 500 foreign subsidiaries of these American companies realized about \$3 billion in total overseas income, employed about 70,000 persons and generated through their operations as much as \$6.8 billion worth of hardware sales to foreign markets.

The report defined such DP services as computer programming; systems design and analysis and other software; data processing, such as time-sharing and key-punching; and rental, leasing and maintenance.

Fourteen Industries

ITC data is contained in a study of 14 U.S. services industries, based on interviews, company responses to questionnaires and current literature. The agency, attempting to define the effects of foreign competition and barriers to U.S. firms, found that for the U.S. DP services firms, international barriers have a "significant" economic effect.

"The major restrictive measures impeding international expansion" for these companies, ITC said, "are the alleged activities by foreign governments which restrict trade in the hardware associated with the services." Further, the generally "weak or ineffective copyright and patent infringement laws" abroad threaten U.S. firms with software piracy.

The report added that international barriers to the flow of communications services adversely affect U.S. DP services firms. Despite these barriers, ITC found U.S. companies to have a strong competitive position in overseas markets.

In Western Europe, for example, six of the top 10 suppliers of these services are U.S.-owned firms. This American service sector is enjoying a 10% to 30% annual growth rate abroad, the report added.

U.S. Still World Leader In R&D Of Semiconductors, Computers

By Bohdan O. Szuprowicz
Special to CW

Despite significant progress made by the fast-stepping Japanese, the U.S. is still the undisputed world leader in high-technology research and development, particularly in semiconductors, computers and lasers. The most recent "Japscam" scandal, in which the Federal Bureau of Investigation nabbed Hitachi, Ltd. and Mitsubishi Electric Corp. trying to acquire IBM computer design data, only underscores the importance the rest of the world attaches to the leadership of the U.S. in technical innovation.

Much of the basic research on which the computer industry is built comes from the famed Bell Laboratories, the R&D organization of AT&T that has been recently given the green light to compete in the com-

puter industry. As a result, there are now concerns that Bell Labs will have to change and concentrate more on product development, which will deprive the country as a whole of its superb basic research. Even so, Bell Labs will spend \$275 million on basic research during 1982, which is more than the rest of the U.S. industry combined. It is this basic research, which accounts for only 10% of the total Bell Labs annual budget, that gives it its fame and makes the overawed Japanese call it America's "national treasure."

Since the antitrust consent decree of 1956, AT&T was required to license Bell's patents to other companies in the U.S. and abroad. Now, as a competitor readying to enter the world markets, AT&T will tighten up its licensing and the biggest losers (Continued on Page 102)

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As CAD/CAM Grows, Hardware Costs Shrink

(Continued from Page 99)

CAM systems. The Predicasts report says that trend will continue through 1995. However, new CAD/CAM applications such as mapping, civil engineering and architecture applications will become more popular. The report notes that the civil engineering and architecture market will grow by an estimated 34% and will account for one-fifth of the total CAD/CAM market by 1995.

Mapping applications of CAD/CAM include demographic analysis, urban planning, seismic data display, topology, cartography and oceanography. That segment of the CAD/CAM market is expected to grow by 22% annually through 1995, the report said.

Other burgeoning applications for CAD/CAM include piping layouts, facility planning and scientific re-

search. Those applications will grow by as much as 20% annually; however, the report notes that it is difficult to predict what new applications will tap CAD/CAM resources.

Ironically, electronics applications of CAD/CAM, which produced the very large-scale integration (VLSI) techniques responsible for many dramatic systems developments, will decline over the next 20 years. The report predicts CAD/CAM growth among electronics firms will be below average at 19%, largely because the electronics business is more concentrated than others studied.

Like prices in the rest of the computer industry, CAD/CAM hardware prices, in terms of total system cost, will decline during the '80s, thanks

largely to developments in VLSI technology. Actual hardware costs, however, are expected to increase at about 6.6% per year, the report said.

CAD/CAM software, while becoming more prolific, is also getting more expensive. Software developments in the CAD/CAM area will include more complex versions of three-dimensional viewing, on-screen menus, multiple view ports, motion (animation and rotation) and solids modeling packages, according to the report.

Other Predictions

The report's other predictions include:

- Standardized networking hardware and software will be developed

during the '80s to allow CAD/CAM systems to communicate with computer-integrated manufacturing systems.

- Group technology will standardize designs and establish a product data base. This will reduce the number of new subsystem designs in CAD/CAM products.

- While the study predicts CAD/CAM systems will remain largely stand-alone units, the systems will become more closely integrated with larger manufacturing systems, machine tools, robots and materials handling systems.

The report, E 71 CAD/CAM, costs \$900 and is available from Predicasts, Inc., 11001 Cedar Ave., Cleveland, Ohio 44106.

Semiconductors To Gain in '83

(Continued from Page 99)

1982, are expected to remain relatively flat, increasing at a rate of only 7% to 8% a year through 1985.

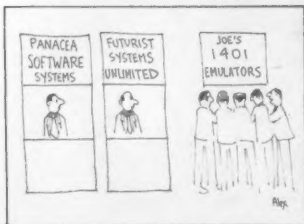
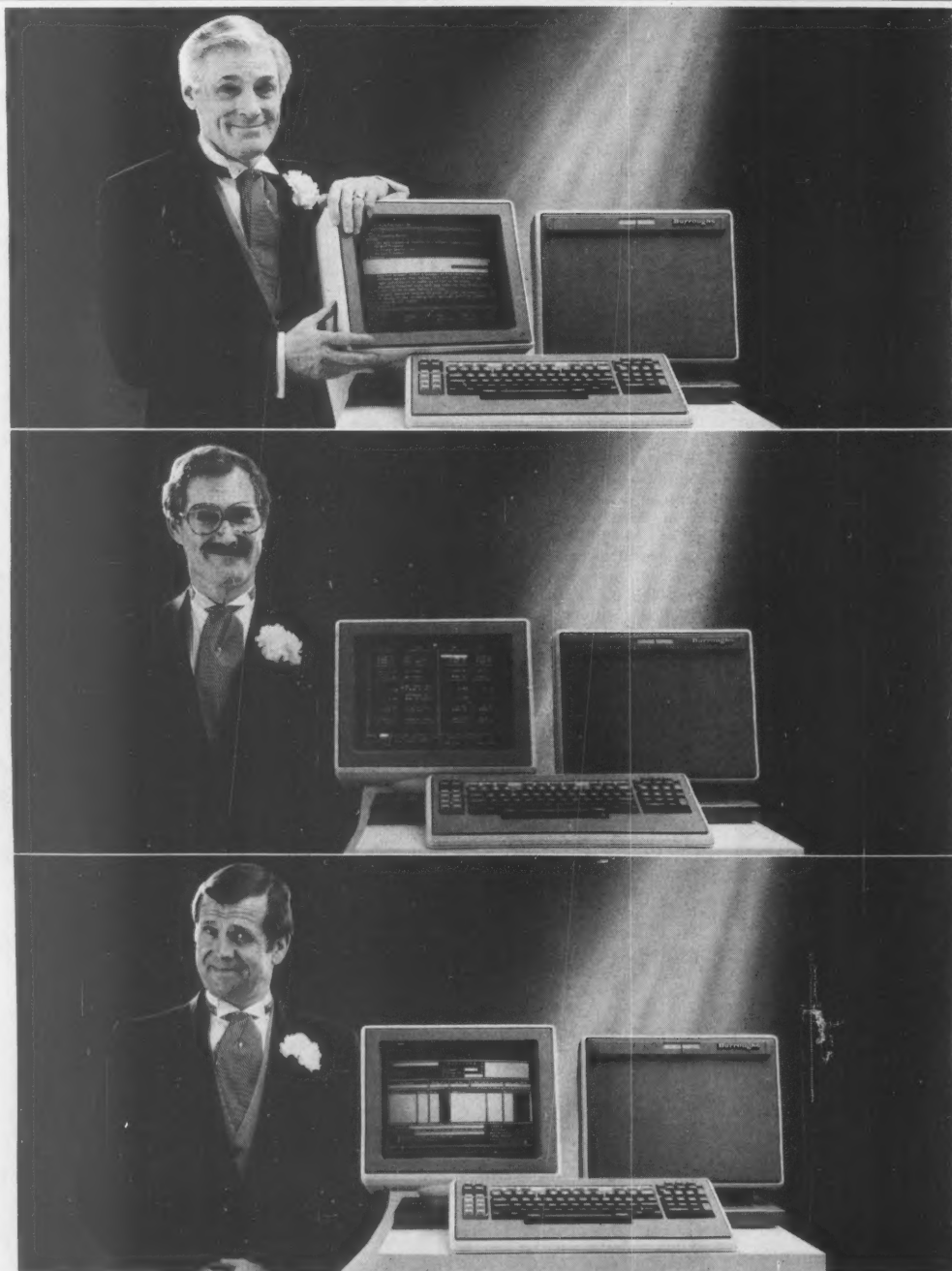
The most dramatic growth will be in the digital Cmos market, which amounted to \$598 million in 1981, the report says. While shipments are only expected to grow by 7% this year, annual increases are expected to jump to 24% in 1983, 28% in 1984 and 33% in 1985, when Cmos shipments are estimated to top \$1.3 billion.

One other area expected to experience rapid growth is digital MOS logic and digital MOS memory. This year they are expected to increase 16% and 13%, respectively, over 1981 levels. They will continue growing at rates of 26% to 31% a year through 1985, the SIA predicts.

Charles Sporck, president and chief executive officer of National Semiconductor Corp., agreed with SIA's assessment of the Cmos market, but sharply disagreed with some parts of the organization's general industry forecast. Speaking to about 700 industry executives recently at the annual SIA forecast dinner, he maintained that the semiconductor industry will "remain flat" for a minimum of six more months. However, 1984 and 1985 will be considerably stronger than 1983.

"The 1985 forecast is conservative in my view," according to Sporck. "By that time, I would expect to see the beginning of an even faster pace than that which is indicated in this forecast."

The twice-yearly semiconductor industry forecast is sponsored by the SIA and the European Electronic Component Association.



Six Companies Vie for 85% Share Study Shows Top Firms in CAD/CAM Market

By Tom Henkel
CW Staff

CLEVELAND — Who are the top vendors of computer-aided design and manufacturing (CAD/CAM) systems? According to a recent study by Predicasts, Inc. (story on Page 99), six companies vie for about 85% of the turnkey CAD/CAM market.

Computervision Corp. is by far the top CAD/CAM vendor, according to the study. The Bedford, Mass.-based company has about one-third of the CAD/CAM market with two basic systems — the entry-level Designer M system and the top-of-the-line APU32, the firm's own specially designed 32-bit processor. The report

notes that Computervision also offers its own specialized operating system, along with Fortran and APL compilers and a variety of applications packages including two-dimensional and three-dimensional modeling packages. Communications capabilities include the firm's CVNET, IBM 2780 and 3270 terminals, Hasp, Sperry Univac's J1004 and Control Data Corp.'s UT-200, the Predicasts report noted.

IBM ranks second to Computervision with about \$100 million in 1981 revenues, as compared with Computervision's \$250 million. IBM's CAD/CAM offerings are based around the Computer-Graphics-Augmented De-

sign and Manufacturing package developed by Lockheed Corp. Typical IBM systems are configured with either a 4300 series, 370 or 30 series processor. Most systems also make use of IBM's 3250 graphics display terminal and other interactive modules.

Applicon, Inc. has an 11.8% market share and generated \$90 million in revenues during 1981. The Burlington, Mass., firm offers systems based around Digital Equipment Corp.'s PDP-11 16-bit minicomputers. However, the firm also has a 32-bit system, the Applicon Graphics 32. Communications options include Decnet, IBM and Hasp protocols, according

to Predicasts.

Calma Co. of Sunnyvale, Calif., features systems based on Data General Corp.'s Eclipse processors, which are integrated by Calma with other purchased components.

Said to be the oldest of the CAD/CAM vendors, Calma accounts for about 10% of the CAD/CAM market with 1981 revenues of \$80 million. The firm's systems are geared to microelectronics, mechanical and architectural designs. Communications capabilities include DG's synchronous interface, IBM 2780, 3780 and Hasp protocols, according to the report.

Intergraph Corp. of Huntsville, Ala., builds CAD/CAM systems based around DEC's PDP-11 and VAX-11 series processors. The firm also produces raster-scan monochrome and color terminals and integrates systems using purchased parts. Communications capabilities include Decnet, IBM 2780 and Hasp. The firm has 10.2% of the market and had 1981 revenues of \$78 million, the Predicasts report said.

Auto-Trol Technology Corp. of Denver develops systems based around Univac's V77 and DEC's VAX-11/780 processors. Applications are geared to mechanical design, petrochemical, architectural and mapping markets. Communications are available via Decnet, Univac and IBM protocols and Hasp, the report said.

The Predicasts, Inc. report costs \$900, the firm said from 11001 Cedar Ave., Cleveland, Ohio 44106.

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Apple Blossoms: 70% Profits Rise, 80% in Sales

CUPERTINO, Calif. — Apple Computer, Inc.'s profits increased nearly 70% to \$19 million, or 32 cents a share, in the fourth quarter that ended Sept. 26, according to estimates provided by the firm. Fourth-quarter sales also increased 80%, rising from \$97.7 million last year to \$176 million.

Earnings for fiscal 1982 were up 50% over last year's \$39.4 million with a 75% increase in sales, according to A.C. Markkula, president and chief executive officer of Apple Computer.

In an interview with *The Wall Street Journal*, Markkula said "more than three new products" are scheduled to be announced within the next year. Among them will be a high-end, personal business computer code-named "Lisa" and a limited, less expensive business computer called "Mackintosh." Apple also plans to release an enhancement of its Apple II computer and may be planning to announce an improved Apple III machine in the near future, Markkula said.

Markkula said the company's current return on equity is about 28% with return on investments of about 33%. The company has about \$150 million in quick assets and negligible debt, he said.

U.S. Still Leader in High-Technology R&D

(Continued from Page 99)
may well be the Japanese and other foreign companies that have been eyeing the lucrative American high-technology markets of the future.

Sign of the Times

These happenings are also a sign of the times. There has been a definite shift in U.S. foreign policy culminating with the resignation of Secretary of State Alexander Haig and more right-of-center elements are emerging as the driving forces behind future American orientation to the rest of the world.

This shift results from

worsening economic conditions as well as from escalating tensions between East and West and a desire to protect domestic markets and militarily sensitive technology.

Foreign investors will still be free to invest in American high-technology ventures and companies, but the era of practically effortless automatic licensing and technology transfers is over. Export controls, despite reactions in foreign markets, are likely to be tightened up also.

These developments, in turn, account for a mounting rush by foreign capitalists to

finance small high-technology start-ups in the U.S., but the price of entry as this flood continues is likely to get considerably higher.

Fifth Generation

Bell Labs is a leader in microelectronics, computers, software and photonics — all critical areas for the new emerging era of what the Japanese like to call the fifth computer generation.

Almost 50% of all the research at Bell Labs is software, however, and the Unix system is rapidly becoming a standard operating system for the 16-bit microcomputers that are clearly the forthcoming massive product group of tomorrow. If anybody, Bell Labs is probably in a better position to innovate in the critical area of user-friendly "super-software" and the new man-machine interfaces of tomorrow.

In comparison with Bell Labs, IBM spent \$1.6 billion on R&D in 1981, which accounts for 5.5% of its sales of \$29 billion. All of IBM's major mainframe competitors except Burroughs Corp. spent a larger percentage of their sales dollars on R&D, but their total expenditures

Study Examines Micros Impact On Business

BALA CYNWYD, Pa. — Although personal computing is becoming pervasive in the business world, an understanding of its impact on corporate information systems is slow to follow, according to a recent market study of 10,000 computer executives conducted by Advanced Office Concepts Corp.

Despite the confusion about setting policies to implement personal computers as part of an overall plan for office automation, the study shows the equipment is moving swiftly into the mainstream because its use and acceptance stems from executives, professionals and managers.

The special report is available for \$14.95 to subscribers of the Advanced Office Concepts newsletter and \$19.95 to nonsubscribers, Advanced Office Concepts said from Suite 433-P, One Bala Cynwyd Plaza, Bala Cynwyd, Pa. 19004.

Correction

The headline on Page 73 in the Oct. 4 issue of *Computerworld* should have been "CSC Sues Tennessee, EDSF."

came to about what IBM spent alone. It takes a lot of innovation, it seems, to keep up with the international computer giant.

According to the latest annual survey on R&D spending conducted by *Business Week*, companies manufacturing computer equipment and providing DP services are leading all industries in the growth of R&D spending, which increased by 34.2% during 1981 in that industry sector. Besides IBM, Honeywell, Inc. and Hewlett-Packard Co. are also among the top 15 R&D spenders in the U.S., as measured by the amount of dollars spent.

Top 15

Telesciences, a \$35 million electronics firm, spent 22.1% of its sales on R&D and was the leading firm evaluated on that basis. But companies like Computer Consoles, Inc., Amdahl Corp., Cray Research, Inc., Intel Corp. and Anderson Jacobson, Inc. were also among the top 15, spending between almost 12% to 18% of their sales dollars on R&D during 1981.

The field at the top becomes really crowded with computer companies when one looks at the amount of R&D dollars that is spent per employee. Here Cray Research and Amdahl are by far the runaway leaders for the American industry as a whole with \$15,060 and \$14,851 spent on R&D for each employee, respectively, during 1981.

Of course the recently formed Trilogy Systems Corp., also run by Amdahl

interests, is already spending about \$60,000 per employee, but at this time this is a start-up situation and such firms are not included in the national survey.

It is important to realize, however, that among the top 15 R&D spenders on a per employee basis, seven are computer hardware firms. Besides Cray Research and Amdahl, they include Computer Consoles, Auto-Trol Technology Corp., Apple Computer, Inc., Floating Point Systems, Inc. and Cado Systems Corp.

Comparison

Perhaps the most dramatic perspective is the comparison of R&D spending of the computer industry with such average expenditures in all U.S. industries. According to the *Business Week* survey, the computer industry companies spent between 5.9% to 6.4% of their sales revenues on R&D, compared with a mere 2% for the U.S. industries as a whole.

Looking at it all from the bottom-line point of view, R&D expenditures ranged from 72.4% of profits among hardware manufacturers to 94.2% among peripherals and service suppliers, while the national average for all U.S. industries is 39.3%.

But the semiconductor manufacturing firms muster even more than that. As a group, they spent 174% of profits on R&D during 1981, by far the highest ratio of any industry category in the U.S. Presumably, that has been one of the secrets of their innovation success over the years.

VAX users have had a difficult choice to make: whether to stay DEC-compatible with a VMS environment, or sacrifice those advantages to switch to the more widespread UNIX operating system.

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Despite Worldwide Recession

Census Reveals UK's Thriving Computer Base

By Bill Laberis
CW Staff

LONDON — The installed computer base is continuing on a path of prodigious growth throughout the UK, despite a worldwide recession that has sent national industrial growth and employment figures into a tailspin.

Moreover, IBM has bolted into the lead as the company with the largest percentage, by value, of installed bases in the UK, surpassing Britain's International Computers Ltd. (ICL). The two had run neck and neck in recent years, combining to account for well over half the value of all installed systems.

These are two findings of *The 1981-82 Annual Census of Information Processing in the UK*, conducted for the ninth consecutive year by BIS-Pedder, Ltd.

The census reports on the installed base of all sizes of computers, from micros to mainframes. It divides the study of general-purpose computers into two groups according to cost: those costing more than \$28,000 and those costing less.

Census figures show that the virtual dead heat for mainframe preeminence has been broken, with IBM now accounting for 31.7% of the value of installed systems and ICL slipping to 25%. In the previous census, BIS-Pedder reported market shares of 29.6% for IBM and 29% for ICL.

ICL's Inner Turmoil

The new figures underscore the turmoil within ICL, which fired 20% of its work force last year, while reporting a \$64 million, six-month operating loss [CW, June 22, 1981].

The census figures also show that, while the number of general-purpose systems costing more than \$28,000 rose by 25% in 1981, the value of installed systems increased only 19%. This suggests a trend or emphasis on smaller, less costly systems. This view is supported further by figures that peg the growth of systems priced between \$28,000 and \$55,000 at 31%, while growth of mainframes costing over \$1.8 million was under 10%.

Apart from IBM, the only other company making any significant gains in the British market is Digital Equipment Corp., which boosted its

share of the installed base (by value) from 4.2% to 5.6%. DEC also leads all suppliers, including IBM, in the number of installed general-purpose systems costing more than \$28,000.

In its analysis of smaller (under \$28,000) systems, BIS-Pedder found "astounding growth" of 132% in the number of such systems. This growth, however, was attributed largely to the sale of inexpensive microcomputers, such as the Sinclair Research, Ltd. ZX81.

The proliferation of low-cost micros notwithstanding, growth in value of all systems priced under \$28,000 is pegged at a healthy 39%, BIS-Pedder reported.

"This demonstrates very clearly the marked drop in the average value of systems which characterized 1981, manifested both in price reductions for existing systems and in technology change pushing down the prices of new systems," the pollster said.

Active Suppliers Decreasing

The report also notes that the number of active suppliers is decreasing because the number of firms that entered the low-end market in 1981 was exceeded by the number that dropped out.

"This outcome is a highly significant departure from previous trends," BIS-Pedder said. This pro-

vides some evidence that this previously volatile market will settle down "into the firm grasp of rather fewer main vendors than currently exist."

Market leaders in this area include Apple Computer, Inc., Commodore Business Machines, Inc. and Olivetti Corp. Burroughs Corp. has progressively faded out of the low-end mini and micro picture portrayed in the census.

The *Annual Census of Information Processing Systems for 1981-82* is available in three volumes, each costing about \$1,600, from BIS-Pedder, Ltd., York House, 199 Westminster Bridge Road, London, England SE1 7UT.

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There will be something for everyone during these three days of conference and exposition at The Rivergate in New Orleans. Exposition hours are 10 a.m. to 4 p.m. on Monday, January 31 and Tuesday, February 1 and from 10 a.m. to 2:30 p.m. on Wednesday, February 2.



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CW

Nickels & Dimes

Wang Laboratories, Inc. has filed a registration with the Securities and Exchange Commission for a proposed issue of two million shares of Class B common stock. Merrill Lynch White Weld Capital Markets Group is underwriting the offering.

\$\$\$

Ragen Data Systems, a wholly owned subsidiary of Ragen Corp., is planning a public offering of 600,000 new shares and 100,000 shares owned by the Ragen Corp. Proceeds from the sale will be used to repay existing debts to Ragen Corp. and for working capital.

Mergers & Acquisitions

Western Union Corp. and E.F. Johnson Co. of Waseca, Minn., announced an agreement for the merger of Johnson and a newly organized Western Union subsidiary. Each share of Johnson common stock will be converted into one share of Western Union common stock. In a separate agreement, Johnson granted Western Union an option to purchase 575,000 shares of its common stock at \$28.50/share.

Information Management International has acquired Hospital Computer Systems, Inc. from Southern Baptist Hospital of New Orleans.

NBI, Inc. has finalized an agreement to acquire certain assets for-

merly owned by Computer and Systems Engineering, the NBI distributor in the UK. Assets and employees involved in selling and supporting NBI's product line will be integrated into NBI's independent subsidiary, NBI Ltd., located in London.

Rubottom, Skaistis and Associates, Inc. of Tulsa, Okla., has sold its computer consulting practice to Thunderbird Financial Corp., which has created a new firm, Thunderbird Automation Group, Inc., and appointed Bruce E. Skaistis president.

Compucare, Inc. has completed acquisition of Space Age Computers, Inc.

DP Franchising Scheme Believed First of Its Kind

By Robert Batt

CW West Coast Bureau

FREMONT, Calif. — Data processing professionals who yearn to become high-tech entrepreneurs, but don't know exactly where or how to begin, can turn to a company here that specializes in providing a helping hand to new start-ups.

Advanced Technical Services, Inc., (ATS) — a five-year-old printed-circuit board manufacturer with annual sales of more than \$3 million — recently established a franchise subsidiary to provide technical and business management training, marketing, distribution and research and development support to fledg-

ling business owners. ATS Franchise Corp. is believed to be a first-of-its-kind venture in the high-technology industry and has attracted a lot of attention since its September launch.

"A lot of people are very interested in starting a high-technology business but lack the proper skill and know-how," said Huey Kin Pak Lee, chairman and chief executive officer of ATS. "Start-up companies are increasingly looking at franchising to help them grow or diversify."

Under the ATS franchise, professionals are given three months of intensive training in how to run a business. They are permitted to use the ATS name and logo and, after training, they receive on-site support including site selection assistance, purchasing and recruitment advice and sales and technical support. In return, ATS gets a 5% royalty on initial sales, which drops to 4% after the first \$1 million of revenue.

Prospective Franchisees

Prospective franchisees will still need to raise their own venture capital, Lee pointed out.

"We have had over 40 inquiries to date from computer engineers, project leaders, manufacturing and sales people. Franchising is less risky than starting on your own, and so it is particularly appealing to people who have a certain amount of technical or business experience but who want to minimize the risk," Lee added.

In general, statistics show that the proportionate incidence of business failures among franchises is significantly less than among other independent businesses, since a franchisee deals in and uses products, services and methods that have been tested and proven, ATS' president claimed.

Another use for the franchise arrangement, Lee continued, is to support R&D work — a kind of "cash cow" arrangement. Instead of spending a lot of capital on development work, the entrepreneur will be able to take advantage of ATS expertise in areas such as component manufacturing, robotics and other automation techniques, Lee pointed out.

Under the ATS arrangement, the franchisee remains an independent business. However, a typical franchise agreement lasts about 10 years.

Although the franchise deal itself is a simple idea, ATS does not promise its clients a free ride. Prospective clients go through a tough appraisal procedure, and those who are approved are promised a rigorous training program to determine those who are committed to succeeding and those who are not.

"The franchisees have to have a 'never-say-die' attitude. They have to have a kind of entrepreneurial spirit, and we will know within the first week of the training program those we are going to support over the longer term," said Lee. Of course, the biggest asset ATS has to offer is support, Lee noted.

"We have made a very strong commitment to support. It requires a lot of investment in terms of field support people, promotion of the franchise idea and the setting up of an effective training program," he said.

Real Time Financial Software Or A Dinosaur In Disguise?

Try finding an ad for financial software without a photo of a CRT terminal. It's almost impossible. Incredibly, behind most of these terminals lurks an outdated batch system. Disguised with a few "online" add-ons to look like real time software.

Don't be misled by these disguised batch systems. Online query highlights old batch data on your terminal. Online data entry add-ons turn your accountants into keypunchers. And easy screen options allow your accountants to customize the CRT "drum card."

Disguised or not, batch systems are obsolete. Management decisions are forced to rely on data that is days, weeks or even months out of date. Data is not only old, it's often wrong. Errors are a major problem because the data origination and correction processes are separate.

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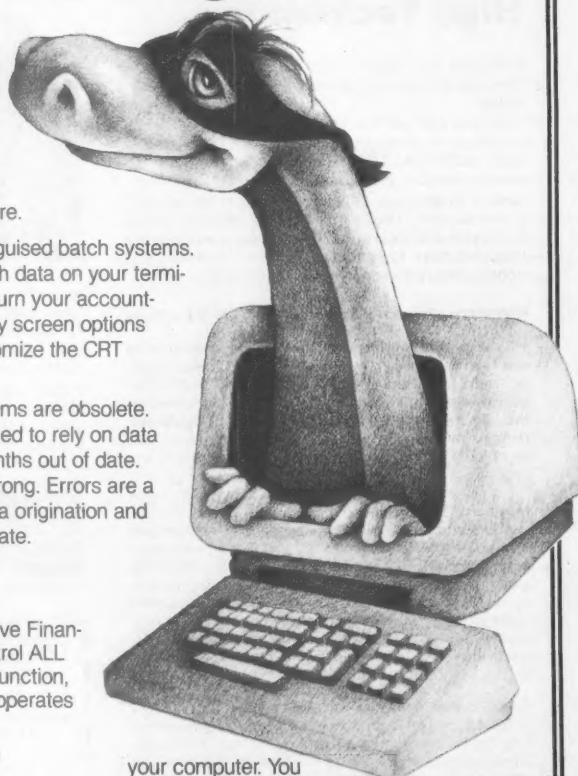
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WALKER



Duo Writes Software to Produce Bug-Free Code

By Lois Paul

CW Staff

CAMBRIDGE, Mass. — After some sleepless nights worrying about the reliability of onboard-flight software they had developed for the Apollo space flights, Margaret Hamilton and Saydean Zeldin decided there had to be a better way to produce software.

They began to evaluate their efforts on large software development projects and found some interesting statistics. According to Hamilton, 73% of the errors with the Apollo onboard flight software she had managed were interface problems — due to data and timing conflicts. In addition, 44% of the errors were found by manual means.

"The project was a 2,000 man-year effort. Of that, 1,000 years were for dynamic simulation for finding errors," Hamilton explained. Sixty percent of the errors were "lurking in revisions that were said to be flight-ready."

Actually, the software was extremely reliable for its time, Hamilton asserted, "but not reliable [enough] for us not to worry about it."

Six Axioms

So Hamilton and Zeldin began analyzing the errors and came up with six axioms to define a system to eliminate errors. The result is the Use.It methodology, software designed to produce bug-free code, which is marketed by Higher Order Software, Inc. (HOS).

Hamilton and Zeldin serve as president and vice-president, respectively, of HOS, which has been in mostly a research and development mode with its product since the company was formed in 1976. A full-time marketing director was added to the 30-person staff only recently, after HOS received venture capital from Venrock and author and industry guru James Martin.

The two women first published their HOS theory in an Institute of Electronics and Electrical Engineers booklet in 1975. They formed HOS in 1976 to turn the theory into a commercial product. They gave the first official demonstration of Use.It in March 1982.

Hamilton came to the Boston area with a B.A. in mathematics from Earlham College in Richmond, Va., and a desire to attend graduate school in mathematics at Brandeis University. She postponed her plans in favor of marriage and the birth of her child. Instead of going back to Brandeis, she began working as a programmer for MIT's meteorology department.

From there, she moved on to Philco where, in her early 20s, she headed a group of programmers working on the Sage System, a program designed to track airplanes in the sky. Her career path eventually brought her back to MIT's Draper Laboratory to work on software for the Apollo and Skylab missions.

Breaks Barrier

Hamilton headed the onboard flight software project. She said she is the only woman to have achieved this management level at Draper MIT. Zeldin ran a guidance section within her division.

"It was unheard of for a woman in that project," Hamilton said. She recalled that interviewers were permitted to ask a woman if her husband was planning to move away. Also, salaries at that time for women were lower because of the "risks" involved.

Hamilton said the Use.It software currently has about six installed users who run it on Digital Equipment Corp.'s VAX-11 supermini to produce Pascal or Fortran code ["Federal User Offers Free CAD/CAM Software" the "Bug-Free Systems" In Depth, CW, Oct. 11]. IBM-based Cobol code is the next target market, she said, and the firm is shooting for having this available between 18 months and two years from now.



CW Photo by C. Marengi

Alan Razdow, the Use.It project manager, demonstrates a graphics editor at HOS.

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Northern Telecom Ltd. announced the activation of Northern Telecom Electronics Ltd. (NTE) and the appointment of Charles G. Millar as its president. NTE, incorporated last year, will manufacture common components for Northern Telecom's operations throughout the world. The manufacturing elements of Northern Telecom's Semiconductor Components Group in Ottawa and San Diego and the printed circuit board facilities at West Palm Beach, Fla., and Belleville, Ontario, will become units of NTE.

Eight more health insurance companies have agreed to participate in the nationwide clearinghouse created by the National Electronic Information Corp. (Neic) for direct computer-to-computer submission of in-patient health insurance claims by hospitals to private insurance carriers.

The eight — Allstate Life Insurance Co., Bankers Life Insurance Co., Benefit Trust Life Insurance Co., Gulf Group Services Corp., Liberty Life Assurance Co., Massachusetts Mutual Life Insurance Co., Mutual Benefit Life Insurance Co. and Pilot Life Insurance Co. — bring the number of participating carriers to 20, representing approximately 70% to 75% of the total dollar volume in private commercial health care claims, according to Neic President Robert S. Bradley.

GCA Corp., a Bedford, Mass.-based designer and manufacturer of semiconductor capital equipment, and Matra Group, a microelectronics firm headquartered in Paris, have signed

an interim agreement to form a joint venture for the development, manufacture and marketing of advanced products used in the manufacture of semiconductors. Details of the joint venture were not announced, pending approval of the agreement by the U.S. and French governments.

Cipher Data Products, Inc. has established its UK facility as a wholly owned subsidiary. The UK office will continue to serve as European headquarters for Cipher, providing sales and support services to West European and Middle Eastern countries.

TEC America, Inc. has formed an Office Products Division that will be responsible for nationwide sales and

distribution of the firm's electronic typewriters, accounting machines and small business computer/word processors.

The Customer Service Division of TRW, Inc. opened its first retail Computer Service Center in Dallas. The center will service most major brands of computer-related equipment, including video games. Computer supplies, software, publications and a computer bulletin board will also be available at the center.

Munson Management Systems has changed its name to American Data Industries and has moved to larger facilities in Irvine, Calif.

Cambridge Digital Systems, a system integrator of Digital Equipment Corp.-based hardware and software, has formed the Cambridge Software Group, which will supply a line of DEC-standard and DEC-compatible software.

A joint venture by Itac Corp. of Santa Clara, Calif., and the Fauji Foundation of Pakistan will soon result in the completion of Pakistan's first major independent electronics manufacturing plant, according to an Itac spokesman. The new plant will have the capability to produce electronic subsystems for computers, telecommunications and industrial and consumer products. The facility, located in Rawalpindi, Pakistan, will occupy 25,000 sq ft and employ more than 600 people. A second plant with the same operating capacity as the first is expected to open within 24 months.

Orders & Installations

Delphi Systems, Inc. will install a turnkey computer system based on its standard insurance management system for Sander A. Kessler and Associates, Inc.

The Central Intelligence Agency has accepted the installation of Ragen Precision Industries, Inc.'s 1010 Information Management System, following an intensive testing period. The system is valued at approximately \$6 million.

Computer Alternatives, Inc., a company specializing in disaster recovery, has ordered a Sperry Univac 1100/82 system valued at \$5.2 million.

The Northern Ordnance Division of FMC Corp., a contractor for the U.S. Navy, has completed installation of a Control Data Corp. integrated computer-aided engineering and manufacturing system valued at \$1.5 million. CDC handled construction of the computer center and provided training for personnel.

Intecom, Inc. has signed an agreement to supply Transamerica Systems with a Model 80 tandem switching exchange and an undisclosed number of remote switching partitions.

Monchik-Weber Corp. will design an office automation system for Merrill Lynch & Co., Inc.

Supershots

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THE TOWER IS COMING. NOVEMBER 8.



Basis, Inc., the U.S. subsidiary of Basis Microcomputer, GmbH, has signed a two-year contract with Amlyn Corp. to purchase \$5 million of Amlyn's floppy disk drives.

The Data Systems Division of A.O. Smith Corp. has reached an agreement with Nichols and Co. to be the Midwest service bureau for Nichols' N5500 project planning and control system as part of its IBM TSO and OS/MVS Remote Computing Service.

Solvation, Inc. has signed a contract with Condor Computer Corp. to purchase several hundred Condor Series 20 data base management systems. Solvation will use the systems as the basis for their new Office Database Manager, an information management package for small businesses.

Contracts & Pacts

International Memories, Inc. has signed an OEM agreement to supply Hewlett-Packard Co.'s Memory Division with its Model 7720 8-in. disk drives for inclusion in HP's 7908 disk subsystem. The agreement is valued in excess of \$3 million.

Gandalf Data, Inc. has signed an OEM agreement with Datastream Communications, Inc. to market the Datastream terminal controllers with their private automatic computer exchange system in the U.S. Gandalf will act as exclusive distributor for all Datastream products in Canada.

NCR Corp.'s OEM Marketing Division has signed a four-year agree-

ment with a potential value of \$5 million with Honeywell, Inc. for the purchase of NCR's EM-40 series of 40-col printers. Honeywell plans to use the printers in its Series 7400 cash-control system.

Micro Five Corp. has signed a joint-venture agreement with Jeumont-Schneider, a French telecommunications equipment manufacturer, to create a U.S. firm that will produce and distribute office automation network systems based on technologies contributed by both companies.

Bunker Ramo Information Systems, an Allied Corp. company, has signed an agreement valued at \$5 million

with Fortune Systems Corp. to purchase and customize the Fortune 32:16 microcomputer. The companies also announced a maintenance agreement under which Bunker Ramo will provide maintenance support for all 32:16 systems.

Executive Corner

- John A. Roth has been appointed president of Northern Telecom, Ltd.
- Demian Harvill has been named president of R.D. Labs, Inc.
- Steve A. Horton has been named vice-president, operations; and Robert N. Tullios has been appointed vice-president, engineering, at Ross-comp Corp.
- Charles Lucia has been named vice-president of marketing and sales at Arrigoni Computer Graphics, Inc.
- Jeffrey B. Bryant has joined Memorex Corp. as vice-president and general manager, Large Disk Drive Division.
- Thomas J. Curran has been appointed vice-president of personnel for Automatic Data Processing, Inc.'s Network Services Division.
- Frank S. Morris has been named to the newly created position of vice-president, business development, at System Development Corp.
- Peter F. Zinsli has been elected to the board of directors of Computer & Communications Technology Corp.
- Jorge Carbo has been named director of the communications product group of American Microsystems, Inc.

Expansions

J.C. Silvestri Associates, Ltd. specializes in end-user education, DP-user relations issues and education in microcomputer technologies. Programs are limited to in-house sessions for maximum effectiveness. The firm also engages in general DP consulting. It is located at 19W555 Lake St., Addison, Ill. 60101.

Filex Corp. will design, manufacture, sell and service electronic office systems. Founded by a former president of the Basic Four Division of Management Assistance, Inc., the firm is located in Costa Mesa, Calif.

New Companies

Siecor Fiberlan, a new group of Siecor Corp., has moved to a new 8,000-sq-ft sales, marketing and engineering facility in Research Triangle Park, N.C.

Micro Focus, Inc. has moved its U.S. sales operations into a new 4000-sq-ft facility in Palo Alto, Calif.

Advanced Technology Systems, Inc. has relocated to new facilities at 302 Technology Park in Atlanta, Ga.

Integral Systems, Inc. has moved to new corporate headquarters at 165 Lennon Lane, Walnut Creek, Calif.



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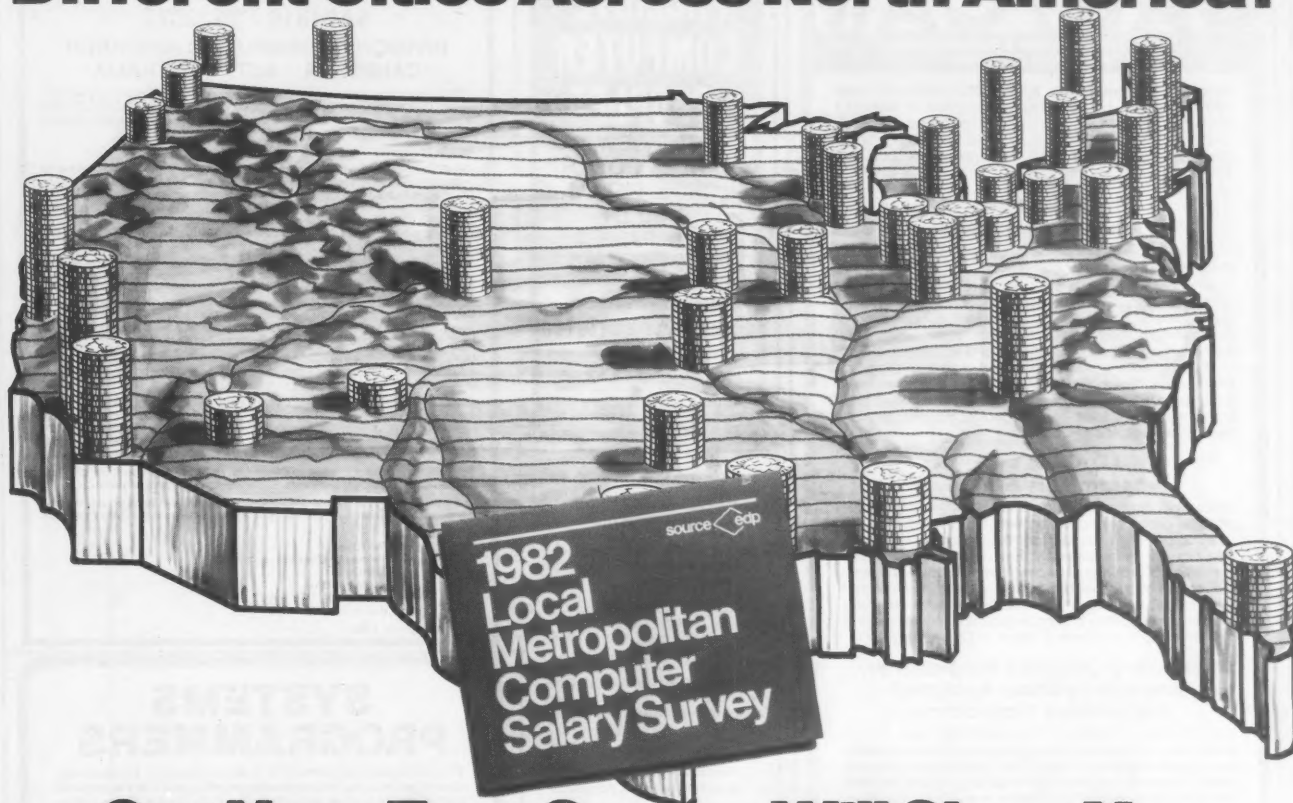


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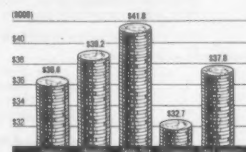
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Send resumes and salary history to:
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Attn: Ken Gerstenkorn

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FIELD: Local Area Networks.

GENERAL: The Division of Computing Research operates an Australia-wide computer network to provide a computing service to CSIRO, Government and other users located throughout the country. Major host computers and network facilities include a CDC Cyber 76, a CDC Cyber 835, a Facom M180, and Facom M180N, a Two Pi V32, a Braegon Automated Tape Library and a Ili COMp80 micrographics unit. Services are offered using the CDC operating systems SCOPE 2 and NOS, Facom OSIV/F4 and IBM VM370/CMS.

The host computers at the Division's Canberra Computer Centre are connected to each other by a local high speed (50 million bits per second) contention network using a Network Systems Corporation HYPERchannel. The Division is currently undertaking a development project in conjunction with Facom Australia Ltd aimed at enhancing the performance of the local network and extending the scope of the shared resources which it supports; the enhanced system will be based on the proposed ISO Open Systems Architecture model.

DUTIES: The appointee will be a member of the Facom Systems Section and will design and implement local network and other systems on the Facom computers.

QUALIFICATIONS: A PhD, or equivalent qualification, in computing science or related field. Proven experience in communication protocols and software or operating systems software is required. Knowledge of, or experience with, X.25 systems, the ISO Open Systems Interconnection and model and Facom OSIV/F4 or IBM VSI, V52 or MVS operating systems would be an advantage.

TENURE: A term appointment to December 1985 with the possibility of a further term not exceeding two years. Superannuation benefits available.

APPLICATIONS: In writing and stating full personal and professional details, the names of at least two referees and quoting reference No. M8771 should reach:

The Chief
Division of Computing Research
CSIRO
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CANBERRA CITY ACT 2601
AUSTRALIA

by November 15, 1982.

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The Wisconsin Department of Transportation in Madison has openings for systems programmers who would like to become part of an innovative organization which utilizes state-of-the-art computer systems. Madison is surrounded by four lakes and hosts the University of Wisconsin.

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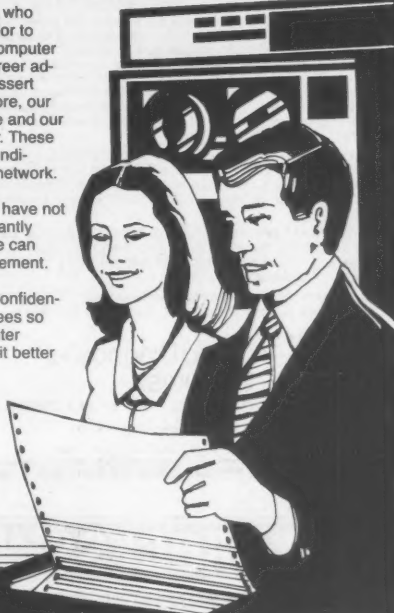
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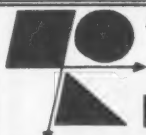
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Here's the data you need to know to place your ad:

The deadline for classified advertising is ten days prior to the issue desired. (That's six working days prior to the issue date). Ads may be sent in by mail. For camera-ready ads, a velox or negative is required. For ads to be typeset by us, enclose a layout if needed, along with any logos or artwork you would like to include in the ad. These must be dark and clear for reproduction purposes.

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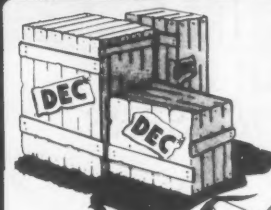
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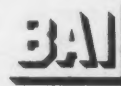
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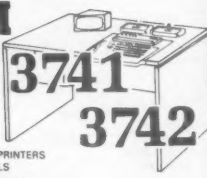
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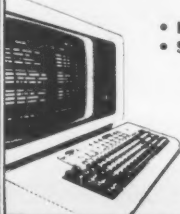
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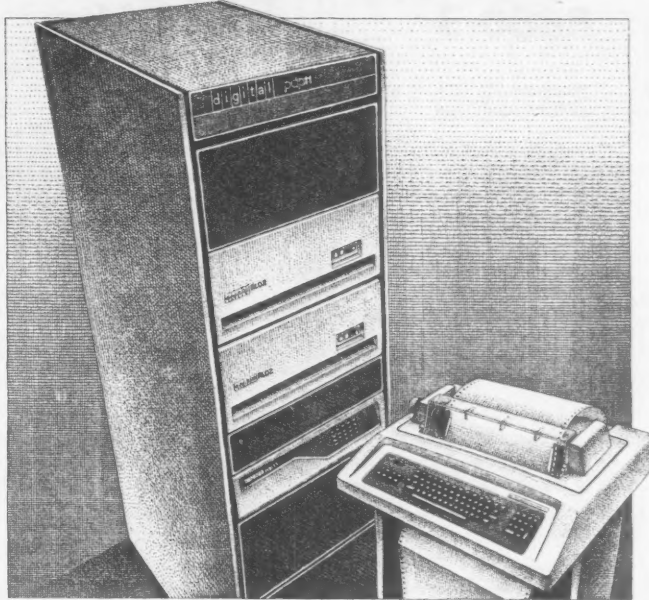
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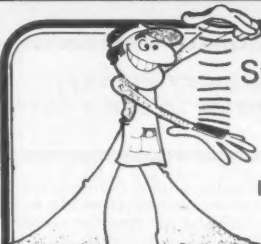
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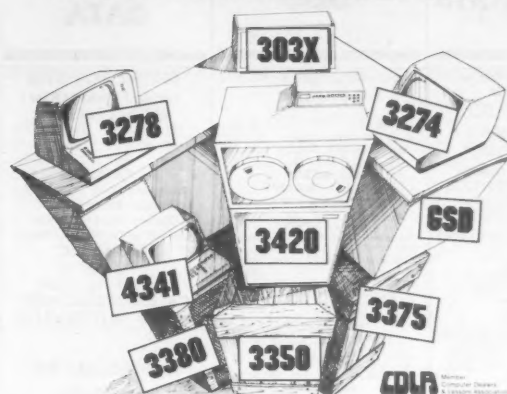
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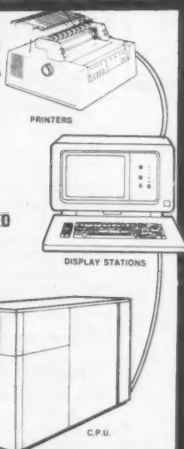
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MISSISSIPPI CENTRAL DATA PROCESSING AUTHORITY

Sealed proposals will be received by the CDPA, 508 Robert E. Lee Building, Jackson, MS 39201 for the following data processing equipment and services:

Request for Proposal Number 783, due Tuesday, November 23, 1982, 3:30 P.M., to contract with a consulting firm to help the Department of Public Welfare in the detail design phase of the Mississippi Application Verification Eligibility Reporting and Information Control System (MAVERICS), an integrated eligibility system that includes the four programs cited below. The firm awarded the contract must provide the State with expertise in designing and implementing large-scale integrated data base systems using IMS, preferably for two or more of the following Welfare programs: AFDC, Food Stamps, Social Services, and Child Support.

Request for Proposal Number 784, due Monday, November 22, 1982, 3:30 P.M., for the acquisition of a computer system with RUE, data entry, word processing, TSO, and CICS to function as an SNA node communicating with an Amstar V6-II and an Amstar V8 running under MVS.

Detailed specifications may be obtained from the CDPA office. The CDPA reserves the right to reject any and all bids and proposals and to waive informality.

Becky Adams or Elaine Knauss,
State Central Data Processing Authority
601/961-4300

Sealed Proposals for the purchase of Police Automated Management Information Crime Statistical System and Administrative Financial System.

Will be received by Bensalem Township at the Municipal Building, 3800 Hulmeville Road, Bensalem, PA until 4:00 pm prevailing time on November 29, 1982. Sealed proposals will be publicly open and read at 8:00 pm prevailing time on November 29, 1982. Contract documents for the above may be examined and obtained from the Office of the Township Manager, Municipal Building, 3800 Hulmeville Rd., Bensalem, PA 19020.

Bensalem Township reserves the right to waive any informality in or to reject any and all bids for any reason whatsoever. By order of the Bensalem Township Board of Supervisors.
By: Natalie A. Strange, Township Manager

The Bulletin Board

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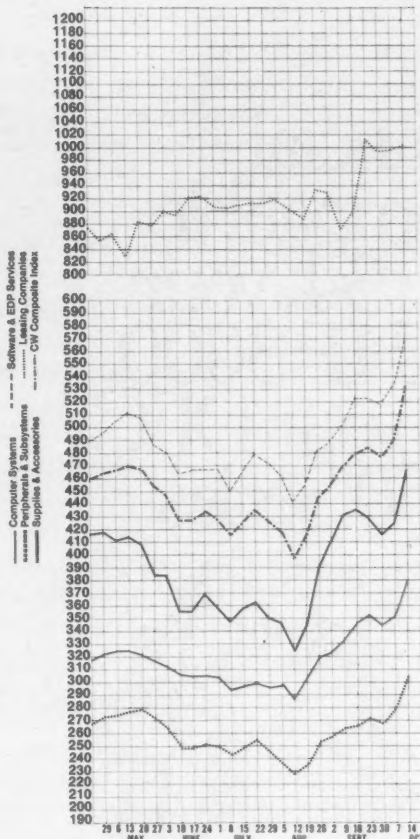
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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, OCTOBER 13, 1982

All statistics compiled, computed and formatted by TRADE QUOTES INC. Cambridge, Mass. 02139

E X C H		PRICE					1981-82 CLOSING RANGE (1)	OCT 13 CLOSE (1)	NET CHG (1)	PCT CHG (1)
		PRICE								
		1981-82 CLOSING RANGE (1)	1982 CLOSING RANGE (1)	WEEK CHG (1)	WEEK CHG (1)	WEEK CHG (1)				
A	ARDAHL CORP	18-46	27 1/2	+1 7/8	+7.3					
N	BURROUGHS CORP	28-72	28 3/4	+2 1/4	+6.0					
O	COMPUTER AUTOMATION	8-28	11 1/4	+1 1/4	+12.5					
N	CONTROL DATA CORP	18-42	34	+13.3						
N	CRAY RESEARCH INC	20-48	38 1/2	+3 1/2	+13.4					
N	DATA GENERAL CORP	21-87	30 1/8	+4 1/4	+16.4					
N	DATAPoint CORP	11-88	16 1/8	+2	+14.1					
N	DIGITAL EQUIPMENT	62-112	95 1/2	+11	+13.0					
A	ECCO INC	8-18	8 3/4	+5/8	+7.6					
N	ELECTRONIC ASSOC.	5-12	8 3/4	+1/4	+2.6					
N	FLOTTING POINT SYST	13-30	24 5/8	+1 1/8	+4.3					
N	FOXBORO	22-62	31 7/8	+1 1/4	+4.0					
O	FULCRUM CORP GRP	1-3	1/4	0	0.0					
O	GENERAL AUTOMATION	3-16	3 3/8	0	0.0					
N	HARRIS CORP	21-80	37 3/4	+3 3/8	+8.8					
N	HEWLETT-PACKARD CO	33-84	62 3/4	+7 3/8	+13.3					
N	HONEYWELL INC	60-115	93 1/4	+13	+16.1					
N	IDN	49-84	83 1/2	+4 1/2	+5.6					
N	IPL SYSTEMS INC	5-13	7 1/4	+1/4	+20.8					
O	MAGNUM CUMP SYSTS	2-32	2	+1/2	+33.3					
N	MANAGEMENT ASSIST	7-28	10 3/8	+1 3/8	+15.2					
O	MINI-COMPUTER SYST	1-4	3/8	0	0.0					
N	MODULAR COMPUTER SYS	7-32	10 3/8	+1	+10.6					
N	MOHAWK DATA SCI	10-32	16 1/4	+1 3/4	+12.0					
N	NCR	38-76	68 5/8	+2 3/8	+4.3					
N	PERKIN-ELMER	17-36	26 3/8	+2 5/8	+11.0					
N	PRIME COMPUTER INC	16-48	29 7/8	+2 5/8	+13.8					
N	SPIRY CORP	21-35	26 1/4	+2 7/8	+12.2					
O	TANDEN COMPUTERS INC	13-35	28 1/8	+3	+11.8					
N	TEXAS INSTRUMENTS	71-151	108 5/8	+8 3/8	+8.3					
A	WANG LABS "B"	24-44	44	+4 3/4	+12.1					
A	WANG LABS "C"	21-44	44 1/8	+4 1/8	+10.3					
LEASING COMPANIES										
O	BOOTH FINANCIAL CP	18-29	24	+1/4	+1.0					
N	COMBISO INC	15-27	25	+2	+8.6					
B	COMMERCE GROUP CORP	1-1	3/8	-1/8	-25.0					
O	COMPUTER INVSYS GRP	1-2	1/4	0	0.0					
O	CONTINENTAL INFO SYS	4-13	13	+2 1/2	+23.8					
N	DPE INC	5-13	10	+1/8	+1.2					
O	ITEL	1-5	5/8	0	0.0					
O	LEASPCORP	1-2	1/8	0	0.0					
N	U.S. LEASING	18-32	32	+4 1/2	+16.3					
SOFTWARE & EDP SERVICES										
O	ADVANCED CORP TECH	1-6	2 1/4	-1/2	-19.1					
O	ADVANCED SYSTEMS INC	8-15	11 1/4	+1/2	+4.3					
O	AGS COMPUTERS INC	7-11	10	+1/4	+2.5					
O	ANACORP INC	10-19	12 3/8	+7/8	+7.6					
O	ANALYSTS INTL CORP	3-14	7	+1 1/2	+27.2					
A	APPLIED DATA RES	12-31	30 1/8	+5/8	+1.5					
O	ASK COMPUTER SYSTEMS	11-21	19 5/8	+1 7/8	+10.5					
B	ASTRADYNE CORP IND	1-5	1 1/4	0	0.0					
N	AUTOMATIC DATA PROC	21-32	22	+1 1/2	+6.7					
O	CGA COMPUTER ASSOC	4-25	9 3/8	-1/8	-2.2					
O	COMPUTER ASSOC INT'L	12-35	34 1/2	+10	+40.8					
O	COMPUTER HORIZONS	1-3	2 3/4	0	0.0					
O	COMPUTER NETWORK	4-9	3 1/8	-3/4	-9.5					
N	COMPUTER SCIENCES	11-30	16 3/8	+3/4	+4.7					
O	COMPUTER TASK GROUP	8-23	6 1/4	0	0.0					
O	COMPUTER USAGE	2-10	2 3/8	+1/8	+5.5					
O	COMPUTE SYSTEMS	12-28	27 5/8	+4 1/4	+18.1					
O	COMSPAC CORP	9-18	18	+2 1/2	+16.1					
O	CONSHARE	6-21	7	+1/2	+7.6					
N	CULLINANE DATABASE	15-45	44 5/8	+4	+9.8					
O	CYBER SYSTEMS INC	9-14	10 1/2	0	0.0					
O	DATA DIMENSIONS INC	1-3	1/4	0	0.0					
O	DATATAS	1-4	3/4	0	0.0					
O	DIVATRON CORP	2-11	2 1/2	0	0.0					
N	ELECTRONIC DATA SYST	15-40	40	+4 1/4	+11.0					
O	INFORMATICS INC	10-23	14 7/8	+1 1/8	+8.1					
O	INSYTE CORP	1-3	1 5/8	+1/8	+8.3					
O	IPS COMPUTER MARKET	1-18	1 1/8	0	0.0					
O	KEANE ASSOCIATES	4-8	4 1/2	-1/2	-10.0					
A	LOGICON	12-38	23 1/4	+1/4	+1.0					
O	MINT SCI ANGR INC	17-26	23 1/2	+1 1/2	+6.8					
O	MATHEMATICA INC	8-18	18 1/4	+2 1/4	+14.0					
O	MATHEMATICAL APP GRP	12-28	14 1/2	+1/2	+3.5					
O	NATIONAL DATA CORP	13-28	18 3/8	+2 3/8	+14.8					
O	PANOROMIC SYSTEMS	8-18	15	+1	+7.1					
N	PLANNING RESEARCH	5-13	8 5/8	+1/4	+2.9					
O	PROGRAMMING & SYS	1-2	1 3/4	+1/4	+21.6					
O	REYNOLDS & REYNOLD	16-26	23 1/2	+1 1/2	+6.8					
O	SEI CORP	17-31	30 3/4	+3	+10.8					
O	SHARED MEDICAL SYST	26-45	44 1/2	+8	+15.5					
O	SCIENTIFIC COMPUTERS	6-16	9 3/4	+1/2	+5.4					
O	SOFTWARE AG	5-23	8 3/8	+3/8	+4.8					
N	TYMSHARE INC	13-38	23	+2	+23.0					
A	URS CORP	10-18	10 1/4	-1/4	-2.3					
N	WVLY CORP	7-20	8 7/8	-1/2	-6.8					
PERIPHERALS & SUBSYSTEMS										
N	AN INTERNATIONAL	1-15	1 1/8	+1/4	+28.5					
A	ANDERSON JACOBSON	9-26	13 7/8	-1/8	-0.8					
O	AUTO-TROL TECHNOLOGY	8-22	14 1/2	+1/8	+0.8					
O	BANCTEC INC	7-35	11	-3/4	-6.3					
A	BECKEINTL	4-18	6	+1 1/8	+23.3					
A	BOLT-BERANEK & NEW	9-26	25 1/2	+2 5/8	+11.4					
O	CAREX CORP	2-8	2	-1/8	-5.8					
N	CENTRONICS DATA CORP	7-40	13 1/2	+2 3/8	+21.3					
A	CETEC CORP	4-8	4	0	0.0					
O	CONITRONICS	2-11	6 1/8	-1/2	-7.5					
O	COMPUTER COMMUN.	1-2	3/4	0	0.0					
SUPPLIES & ACCESSORIES										
N	AMERICAN BUS PRODS	11-19	17 3/4	-3/8	-2.0					
O	BALTIMORE BUS FORMS	1-2	1	0	0.0					
N	BARRY WRIGHT	14-24	18 3/4	+2 5/8	+15.3					
O	CYBERMATIC INC	1-1	1	0	0.0					
N	DEXUS PRODUCTS INC	12-18	17 3/4	+1 1/4	+7.5					
N	ENNIS BUS FORMS	13-27	25 3/8	+1	+4.0					
N	EX COMPANY	48-78	74 1/2	+6 1/4	+8.4					
O	MOORE CORP LTD	26-38	37	+4	+12.1					
N	NASHUA CORP	9-33	10 7/8	+1 7/8	+20.8					
O	STANDARD REGISTER	20-37	36 1/4	+1 1/2	+4.5					
A	TAB PRODUCTS CO	12-30	18 3/4	+2 3/8	+14.3					
N	MALLACE BUS FORMS	22-40	38 3/8	+2 3/4	+7.5					
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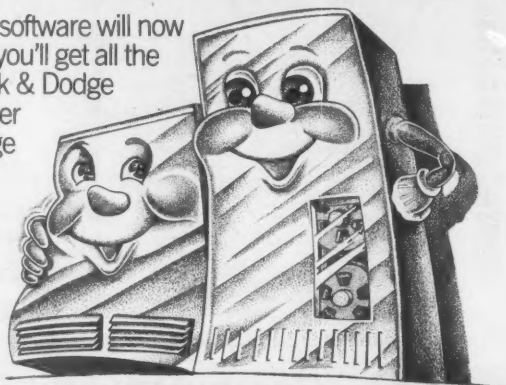
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